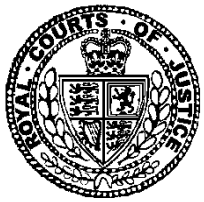

Neutral Citation Number: [2026] EWHC 999 (Pat)
Case No: HP-2024-000044

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (ChD)
PATENTS COURT

The Rolls Building
7 Rolls Buildings
Fetter Lane
London EC4A 1NL
1 May 2026

Before:
MR. JUSTICE MEADE

Between:

(1) SAMSUNG ELECTRONICS CO., LTD
(a company incorporated under the laws of the Republic of Korea)
(2) SAMSUNG ELECTRONICS (UK) LIMITED

Claimants

- and –

(1) ZTE CORPORATION
(a company incorporated under the laws of the People's Republic of China)
(2) ZTE (UK) LIMITED
(3) NUBIA TECHNOLOGY CO., LTD
(a company incorporated under the laws of the People's Republic of China)
(4) LIVEWIRE TELECOM LIMITED
(5) EFONES.COM LIMITED

Defendants

- -

Hearing dates: 19-23 and 26-30 January, 9-11 February 2026

REDACTED JUDGMENT

DANIEL ALEXANDER KC, JAMES SEGAN KC, and **KATHRYN PICKARD KC** (instructed by **Kirkland & Ellis International LLP**) appeared for the **Claimants**.

SARAH ABRAM KC, LIGIA OSEPCIU, and **EDMUND EUSTACE** (instructed by **Powell Gilbert LLP**) appeared for the **Defendants.**

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Remote hand-down: This judgment will be handed down remotely by circulation to the parties or their representatives by email and release to The National Archives. A copy of the judgment in final form as handed down should be available on The National Archives website shortly thereafter but can otherwise be obtained on request by email to the Judicial Office (press.enquiries@judiciary.uk).

Confidentiality markings in this judgment:

[REDACTED EEO/CISZ] = information that is EEO or is confidential information of the Claimants or Defendants.

[REDACTED COMINF] = confidential information obtained from third party data providers.

[REDACTED CBP] = information that is confidential as between the parties.

Mr Justice Meade:

INTRODUCTION

1. This is my judgment following a trial to consider the terms of a global, FRAND portfolio cross-licence between the Claimants ("**Samsung**") and the Defendants ("**ZTE**"). The FRAND obligation in question is that under the ETSI regime.

2. The parties made a previous licence agreement in 2021 (the "**2021 PLA**") but have been unable to agree the terms of a renewal, although they agree there should be one. I refer in this judgment to the renewal licence, the terms of which are to be determined by this Court, as the **Court-Determined Licence** or **CDL**.

3. As so often in FRAND disputes, the key issue that divides the parties is price, which it is agreed I should state as a lump sum, though there are also some disputes over non-royalty terms. Although a renewal would be a cross-licence the commercial picture is that Samsung's mobile phone sales are by far the dominant economic driver and the critical factor is how much should be paid for them. For the same reason, it is clear, and common ground, that Samsung will be the net payer.

4. The parties' inability to agree a renewal has led to widespread litigation. There has been a dispute over which court should rule on the terms of any renewal: Samsung preferred this Court, and ZTE preferred that a decision be made in China (specifically in Chongqing). That led to the decision of the Court of Appeal in [2025] EWCA Civ 1383 setting aside the decision of Mellor J in [2025] EWHC 1432 (Pat) to make an interim licence declaration; the parties had agreed that there should be an interim licence and as to all of its terms except which court should make the decision about the terms of the final renewal licence.

5. In this setting, the Intermediate People's Court of Chongqing Municipality (the "**Chongqing Court**") had already held a FRAND trial prior to the start of the trial before me. I am told by the parties that the Chongqing trial was only about cellular SEPs, whereas the present trial also includes a claim by Samsung to a licence covering non-cellular SEPs and NEPs, although that is a relatively minor dispute which narrowed further during trial.

6. As well as the two FRAND trials there are also infringement cases going on internationally: for example, an infringement trial in which ZTE alleges infringement by Samsung was held in the German national courts two days after the last day of the trial before me. The action in the UK also includes claims by Samsung for alleged infringement of its patents by ZTE, which were ordered to be determined in separate "technical" trials in due course (but see further below, as this position changed).

7. As Arnold LJ has observed on a number of occasions, this profusion of litigation is a symptom of a dysfunctional system, whose critical problem is the lack of a dispute resolution mechanism within the ETSI rules. It is especially unfortunate that all this litigation has been seen by the parties as necessary when they have been in a previous consensual licence relationship, agree that there should be a renewal, and agree on almost everything but price.

8. A further complication is that although Samsung has undertaken to enter into the CDL as decided by me, ZTE has not (since otherwise it would effectively have to abandon the Chongqing proceedings). ZTE says that the Chongqing decision will give rise to a *res judicata* here, which Samsung disputes. I have not heard any submissions about whether the Chongqing Court would compel Samsung to enter into a licence.

Overview of the parties' valuation cases

9. Both parties' valuation cases are based on comparables, while ZTE also relies on a top-down methodology as a cross-check.

10. Samsung's primary position is that the most appropriate comparables to use in this case are those to ZTE's own portfolio. Samsung relies on the 2021 PLA and alternatively on a licence agreement between ZTE and Apple (**ZTE-Apple 2020**). I will refer to the 2021 PLA and ZTE-Apple 2020 collectively as the "**Big Two**" where appropriate. Using this abbreviation is convenient where the arguments apply equally to each of them, but I do not lose sight of the fact that in other respects they have some significant differences. It is also an abbreviation that emerged during the trial so is not used in the written evidence or pleadings.

11. In the ordinary course of events, one would expect that the 2021 PLA and possibly ZTE-Apple 2020 would indeed be used as comparables for the CDL; indeed it might well not be necessary to look any further. But matters are not so simple, because ZTE says that both those agreements were so seriously affected by non-FRAND factors that they cannot be used as comparables at all.

12. I will need to expand below on the non-FRAND factors alleged, but in a nutshell ZTE says that it entered into negotiations with Samsung and Apple in the shadow of having been the subject of sanctions by the USA which effectively killed its previously thriving handset business and forced it to try to monetise its patent portfolio. It alleges that it told both Samsung and Apple that it wanted a quick deal to bring in cash and that to achieve that it would be willing to give lower rates than would otherwise apply. It says that it did not really want to license its 5G patents because it was not ready to do so (so initially offered only its 4G portfolio) but was pushed into doing so by both counterparties, although there is a dispute about to what extent the 2021 PLA covered 5G – see below. It says it did not derive any proper value for 5G in either deal. Samsung disputes most if not all of this and in particular says that by the time the Big Two were concluded ZTE's financial position had recovered from sanctions and was very healthy.

13. It is not alleged that there was any subjective bad faith involved in the negotiation of either deal, and it is important to bear in mind that I do not have evidence from Apple anyway, so I do not have its side of the story.

14. Instead of the 2021 PLA and ZTE-Apple 2020, ZTE's valuation case relies for comparables on three licences that Samsung has concluded with other counterparties: **Samsung-Ericsson 2021**, **Samsung-Nokia 2023**, and **Samsung-InterDigital 2025**; collectively the "**ENI**" licences. These are licences in which Samsung was the net payer, so the key portfolios were those of the other counterparties, i.e., importantly, not ZTE's portfolio (at this point I digress to

mention that while many of the licences I have had to consider are cross-licences, it is usually obvious that one side is by far the net payer and so can reasonably be called the "licensee" and by the same token the other party can be called the "licensor" even though taking a cross-licence. Similarly, I refer to "in-licences" and "out-licences" sometimes in relation to cross-licences, for like reasons. Situations where one side in a cross-licence is by far the net payer can arise from relative portfolio differences, or because the licensee has much bigger sales, or a combination of both).

15. For reasons that I will come to explain, ZTE's reliance on Samsung-InterDigital 2025 faded away by the end of the trial, because it was an arbitration award and not a negotiated deal. This does not affect ZTE's basic arguments relying on the other two licences in the ENI group, though. I will continue to use the ENI acronym in this judgment, but bear in mind the reduced importance of the InterDigital licence.

16. Another three of ZTE's own licences were also in issue at this trial – **ZTE-Vivo 2024**, **ZTE-Oppo 2024**, and **ZTE-Xiaomi 2024**; collectively the "**VOX**" licences. [REDACTED EEO/CISZ]

17. For different reasons, the parties said that the VOX licences were not useful as comparables, as such. ZTE said that was because [REDACTED EEO/CISZ] and it sought to rely on them only for the limited purpose of showing that there was no market price for the ZTE portfolio, hence militating for using licences that Samsung concluded with other counterparties as comparables instead. Samsung on the other hand said that the VOX licences could not be reliably unpacked, mainly because [REDACTED EEO/CISZ], though at the start of the trial it seemed positively to rely on them in support of a non-discrimination case. I deal with the VOX licences in more detail below but say no more about them for now.

18. Samsung says that the ENI licences are useless as comparables because the counterparties had different and much stronger portfolios than ZTE's with numerous "litigation grade" patents, and were the toughest and most experienced licensors, with well-founded reputations as the most aggressive and tenacious litigants, willing and able to get injunctions in short time frames in courts such as those of Germany.

19. In further response to ZTE's valuation case based on the ENI licences, Samsung argued that if reliance were to be placed on Samsung licences, then the better comparables would be a group of licences with four other counterparties: **Samsung-NEC 2022**, **Samsung-Docomo 2023**, **Samsung-Datang 2024**, and **Samsung-Sharp 2024**; collectively the "**NDDS**" licences. By the end of the trial, Samsung focused rather more on Samsung-Datang 2024 and Samsung-Sharp 2024 than the other two.

20. Samsung also concluded a licence with Huawei: **Samsung-Huawei 2022** (and often it was grouped with the other four of NDDS to constitute the "**NHDDS**" licences). Samsung-Huawei 2022 occupies a particular position in the case because both sides, rather tentatively, identified it as potentially offering a middle ground between the Big Two on the one hand and the ENI licences on the other.

21. Samsung's position as to what constitutes a FRAND lump sum royalty is not more than $200m, including any allowances for non-FRAND factors (it disputes there should be any such allowances but says that if there are any they ought to be small). Specifically, Samsung argues for [REDACTED CBP] based on the 2021 PLA or [REDACTED EEO/CISZ] based on ZTE-Apple 2020. ZTE's position is $731m.

22. It is worth noting at this stage that ZTE's originally pleaded case was for a lump sum royalty of at least [REDACTED EEO/CISZ]. The considerably lower $731m figure comes from an offer made by ZTE in October 2024, before it saw the ENI licences in disclosure in these proceedings, which was based on a top-down analysis, and the figure was introduced into the pleadings in this litigation by amendment by ZTE on 9 December 2025. The top-down analysis supporting the $731m figure has, on the other hand, not been introduced into this case. The top-down cross-check that ZTE still relies on and that I have to consider is not a means for getting to a specific figure, but something that ZTE said I can use to test the methods that the parties have put forward as their main cases.

23. ZTE acknowledges that the amended $731m figure does not tally with the lump sums that Dr Chowdhury (ZTE's valuation expert) derived from the ENI licences (ranging from [REDACTED EEO/CISZ] to [REDACTED EEO/CISZ]). It says that it has chosen to honour the $731m offer.

24. Samsung says this shows that ZTE has no confidence in the case on the ENI licences being comparable.

25. ZTE retorts that its position simply means that while the ENI licences are indeed comparables, I can be certain that the $731m, being so much lower than could otherwise be justified, is FRAND (or rather, definitely not above FRAND – for the moment I leave to one side the fact that FRAND is a range or corridor).

Disputes about the scope of the 2021 PLA

26. It is worth mentioning at this early stage that there are two disputes about the scope and meaning of the 2021 PLA. First, there is a dispute about the extent to which it covered 5G patents and/or technology, which arises from the fact that patents essential to 4G can also be essential to 5G and that technology used in 4G may or may not also be used in 5G. Second, it contained a covenant not to sue ("**CNS**") for the period of 1 January 2024 to 31 December 2024 and there is a dispute about whether Samsung was effectively licensed for sales made in that time (Samsung's position) or whether liability to pay was merely deferred (ZTE's position).

27. The two disputes are doubly important because they affect not only unpacking of the 2021 PLA, but also repacking using any comparable licence to determine how much Samsung should pay. To put it rather crudely, the more that was licensed under the 2021 PLA the lower the rate that its lump sum payment would imply, and the less there is still to be paid for under the CDL.

Outline of my conclusions

28. I have concluded that the ENI licences are not usable as comparables at all. The two main reasons are (i) the portfolios of the three ENI counterparties being so different from the ZTE portfolio, even once sheer size is accounted for, and (ii) the ENI counterparties' very great expertise at out-licensing and, particularly, their willingness and ability to litigate. The willingness to litigate in particular means that it is highly likely there was a very substantial non-FRAND factor at play, such that Samsung paid in substantial measure to avoid injunction risk and not just for the technology of the counterparties' patents.

29. The NHDDS licences were only relied on by Samsung as a counterbalance in case I thought the ENI licences were appropriate comparables, so given my rejection of the ENI licences they do not really matter. In any event, they vary a lot between themselves, and the huge differences in implied rates between them as one group and the ENI licences as another group lead me to conclude that it is impossible to identify a FRAND pattern or standard or "going rate" from which I could reliably proceed using Samsung in-licences. General factors which might have been at play can be articulated, but their interaction is impossible to pin down, and in particular the overall picture from the totality of the Samsung in-licences I have considered is so much all over the place that they cannot assist in deciding where, on the very wide spectrum that they embrace, FRAND should lie, even to the extent of deciding whether ZTE's $731m is or is not safely on the right side of FRAND.

30. To the extent it matters (given that neither side pressed for them), I reject any reliance on the VOX licences. I think Samsung is probably right that they cannot reliably be unpacked, whether or not they are comparable.

31. The Big Two are *prima facie* good comparables and the best place for me to start. But I largely accept ZTE's arguments that they are affected by non-FRAND factors, and severely so.

32. ZTE did indeed go into both negotiations making clear to Samsung and to Apple that it wanted a quick deal and would take a lower price to get rapid cash. It may seem odd that it would so clearly signal weakness in this way at the very outset of talks, but of course if it had not said that it wanted a quick deal then it would have had to wait for the "normal" length of FRAND negotiations. So it had to be upfront with the counterparties.

33. I also accept that this initial position was thrust on ZTE as a result of US sanctions (it goes without saying that I express no view about the merits of the sanctions and ZTE did not ask me to). It is true that as matters turned out both negotiations took longer than ZTE might have liked, and that the licences were concluded at a time when ZTE had recovered from sanctions to some extent and had substantial assets. But I accept ZTE's evidence that its management had nonetheless decided that it had to prioritise establishing a licensing business to create an inflow of cash, and having signalled that it would take a lower price at the start of the negotiations it was not in a position to go back on that and suddenly ask for much more. So the sanctions had a lasting effect on negotiations even as ZTE went about recovering from them.

34. I also find that ZTE was affected by having minimal experience in out-licensing its portfolio, and by being ill-prepared to license its 5G patents. Yet it was negotiating against two of the most experienced and toughest licensee-side licensing teams and was materially outmatched.

35. ZTE was also in a position in which it would have been perceived as having only low willingness and/or ability to litigate its patents by infringement proceedings, whereas Samsung and Apple were much better placed to defend any such claims. I elaborate the details of this below. I do not conclude that ZTE had *no* outside options if negotiation failed, but it was weak.

36. As a result of all these factors, ZTE realised only a low price in each of the Big Two. One particular way in which this was manifested was that it was pushed around in relation to its 5G patent rights when those were demanded to be licensed by Samsung and by Apple (considerably more in the former case than the latter).

37. I refer to these matters as "non-FRAND factors" deliberately. No conscious bad faith or deliberate delaying tactics on the part of Samsung or of Apple was alleged. It was the duty of their negotiators to get the best price they could and they cannot be criticised for taking advantage of ZTE's open expressions of weakness. So it would not be right, or at least not accurate, to call any of this "hold-out". ZTE simply did not get the objectively appropriate FRAND price for its technology as represented by its patents as would have been agreed between willing parties not under extraneous pressure. ZTE is entitled now to insist on full FRAND value in the CDL.

38. As to the disputes on interpretation of the 2021 PLA, I find in favour of Samsung on both. This means that 5G was largely licensed for the duration of the agreement, and that for the period of the CNS Samsung was, effectively, licensed to the extent it contends. The fact that 5G was largely covered does not necessarily imply that ZTE obtained proper FRAND value for it, of course, and I have said it did not, and the same applies to ZTE-Apple 2020 where 5G was expressly and fully licensed.

39. So I conclude that the Big Two are the only appropriate comparables but were severely affected by non-FRAND factors, and the question is what I should do from there.

40. I have concluded that I should first decide whether to use one of them to the exclusion of the other, or to use both, and then to adjust for the non-FRAND factors.

41. The 2021 PLA has the advantage that it is not only a licence of the same portfolio from the same licensor, but is also to the same licensee. Despite that, I think that ZTE-Apple 2020 is significantly to be preferred and I proceed from it, and not the 2021 PLA. The main reasons are that ZTE-Apple 2020 (i) was less affected by non-FRAND factors so requires less adjustment, and less subjective adjustment, (ii) does not have the complication of being a partial licence of 5G, and (iii) consequently leads to less difficulty when unpacking. The advantage of the 2021 PLA as being to the same licensee turned out on the evidence to be of

low to no importance, because the parties and experts are largely agreed that ZTE-Apple 2020's being to a different licensee can be allowed for satisfactorily.

42. I adjust for the non-FRAND factors in two ways.

43. First, I notionally adjust the lump sum paid by Apple to reflect how much more in absolute dollar terms I think ZTE would have obtained if it had not been giving a discount for Apple being one of its very first licensees (effectively equal first with Samsung) and if it could have realised full value for its 5G patents.

44. Second, I make an assessment of how much ZTE had to discount past sales. That adjustment cannot be done simply by a notional change to the lump sum, but needs to be factored into the mathematics of the unpacking. It is a subjective assessment to a significant degree but I have useful guidance from the facts of what happened.

45. I do not make a separate adjustment for the general weakness of ZTE's position, but instead have factored it in to deciding the size of the other adjustments: the first licence discount, the underperformance on 5G and the past sales discount, and the magnitude of each, were all, in part, consequences of the general weakness.

46. I also make various decisions below in relation to a number of disputed points about the mechanics of unpacking and repacking. I find that ZTE is right about some, and Samsung about others. The most material in methodological terms, indeed structural, is that I find in favour of Samsung that the unpacking should be by dollar per unit ("**DPU**"), and reject ZTE's *ad valorem* approach, done with no cap on the unit price. These various decisions are largely ones of principle rather than subjective judgments about where some value should lie on a scale.

47. When this judgment was nearing completion I asked the parties to provide a spreadsheet to calculate the overall balancing payment under the CDL on various combinations of assumptions as to past sales discounts and the effect of the 2021 PLA (and they added one other more minor variable), applying my other conclusions on unpacking/repacking methods. I was able to vary the lump sum adjustments for first licence discount and 5G (initially myself and later with a modified spreadsheet from the parties which I used to confirm my own workings), and I chose a set of values which I considered (i) individually appropriate and (ii) as a cross-check on myself, such that I was satisfied from an overall perspective that the total amount of the lump sum under the CDL is FRAND.

48. That produces a lump sum for the CDL of $392m.

49. I reject ZTE's top-down cross-check because on the facts of this case it is excessively sensitive to its underlying assumptions, and in the light of those sensitivities it produces such widely varying results that it is incapable of helping choose between the parties' competing positions, even as a check.

50. Although I have decided to use ZTE-Apple 2020 to the exclusion of the 2021 PLA, my sense is that working from the 2021 PLA I would have made bigger adjustments in ZTE's favour and probably ended up with a somewhat similar

result, albeit a less reliable one. Had I tried to use both together the relative unreliability of the 2021 PLA would still have affected the overall result and I would have faced the difficult task, for which neither side argued or gave me a roadmap, of blending them together.

PROCEDURAL BACKGROUND

51. Samsung and ZTE started negotiations for renewal of the 2021 PLA in mid-2023. The 2021 PLA cross-licence came to an end on 31 December 2023, with the one-year CNS beginning on 1 January 2024.

52. On 19 December 2024, Samsung initiated these UK proceedings against ZTE. Samsung alleges that ZTE has infringed a number of Samsung UK SEPs and seeks a FRAND injunction in respect of those patents. Samsung also seeks declarations of invalidity and non-essentiality in respect of certain ZTE UK SEPs, and in the alternative, in a format now familiar to the English courts, asks this Court to determine the terms of a FRAND licence, which is to be a single global cross-licence covering Samsung's and ZTE's respective portfolios.

53. Samsung has undertaken to enter into the CDL. ZTE has not challenged this Court's jurisdiction in these proceedings, but neither has it given an undertaking to enter into the CDL. ZTE has not counterclaimed for infringement of any ZTE UK SEPs or otherwise sought a FRAND injunction against Samsung in this jurisdiction.

54. On 13 March 2025, Mellor J ordered this FRAND trial to be expedited and commence in January 2026.

55. In June 2025, Mellor J granted Samsung an interim licence declaration.

56. On 18 July 2025, Samsung, relying on the interim licence declaration, complained to ETSI that ZTE was in breach of the ETSI IPR Policy. On 26 August 2025, the ETSI Secretariat commenced disciplinary proceedings against ZTE. On 14 October 2025, ZTE obtained an *ex parte* preliminary injunction from the Munich I Regional Court requiring Samsung to withdraw the complaint. On 16 October 2025 Samsung withdrew the ETSI complaint, and the next day ETSI confirmed that following Samsung's withdrawal of its complaint, the disciplinary proceedings against ZTE were terminated.

57. On 31 October 2025, the Court of Appeal allowed ZTE's appeal against Mellor J's June Order and set aside the interim licence declaration.

58. Two "technical" trials (i.e. of validity and infringement), which could result in a UK FRAND injunction against ZTE, were listed to be heard starting in March 2026 (shortly after this FRAND trial concluded) and May 2026. During the course of this FRAND trial and following my asking the parties about the need for both technical trials, the parties agreed to stay the May technical trial. The March technical trial ("technical trial A") has been heard by Mellor J and judgment is awaited.

Disclosure hearings

59. There have been two CMCs where Mellor J dealt with disclosure, **CMC 3** ([2025] EWHC 2563 (Pat)) and **CMC 4** ([2025] EWHC 3049 (Pat)). I address these hearings here separately and in some detail as they are relevant to an argument run by ZTE at trial asking me to draw adverse inferences against Samsung in relation to the alleged non-FRAND factors which affected Samsung in-licences.

60. CMC 3 concerned *inter alia* Samsung's application for specific disclosure from ZTE. Mellor J ordered disclosure concerning the VOX licences and ZTE-Apple 2020, confined to certain aspects of ZTE's documents.

61. CMC 4 concerned *inter alia* ZTE's application for specific disclosure from Samsung in relation to the ENI and NHDDS licences. The relief sought included the following:

> The Claimants shall, by 20 November 2025, provide disclosure of the following:
>
> (a) written communications between Samsung and each of the Samsung Counterparties and internal Samsung documents recording any oral communications between Samsung and each of the Samsung Counterparties in respect of the Samsung Licences insofar as they relate to:
>
> (i) the geographic coverage of the Samsung Counterparty's portfolio;
>
> (ii) the value of any non-cellular SEPs and non-SEPs licensed; or
>
> (iii) the impact of any litigation brought in connection with those licences (or the relevance of litigation brought by the Samsung Counterparty against other companies); and
>
> (b) internal documents prepared for or by relevant Samsung management for the purpose of seeking or giving approval for the conclusion of each of the Samsung Licences.

62. Paragraph 1(a) was dropped by ZTE towards the end of the hearing, but paragraph 1(b) was pursued. Mellor J refused ZTE's application. As recorded in the judgment, during the course of the hearing it became apparent to Mellor J that disclosure was being sought on a broad basis: that where one can see a big delta between the outcome derived from different licences, some disclosure might help to explain the delta. Mellor J considered that if the documents sought really did go to a critical question in this case, the application for disclosure of them would have been made long before when it was actually made (i.e., only some nine weeks away from trial) and the justification would have been properly and fully developed in ZTE's evidence (which it was not). I note that disclosure of all the licences that are relied on in this case was ordered in March 2025.

63. Mellor J also rejected ZTE's application on the basis that for the most part reliance was placed by both parties on objective factors in the pleadings and

evidence in respect of the Samsung licences. This was to be contrasted with ZTE's pleadings relying on subjective factors in relation to ZTE-Apple 2020 which gave rise to the disclosure ordered in CMC 3.

64. ZTE however was not shut out by Mellor J from making a further application if it was convinced that the disclosure sought really was critical to a fair FRAND trial and if it could put forward a proper justification. ZTE renewed its specific disclosure application, leading to a hearing on 27 November 2025 ([2026] EWHC 3549 (Pat)). There, at a stage where fact and expert evidence was by and large complete, Mellor J was again unpersuaded that the documents sought should be disclosed, as not much had changed in the pleadings and evidence relied on and in the submissions made by ZTE when compared to what was before the Court at CMC 4. Counsel for ZTE did submit that these documents would be important to the Court's decision as to which set of comparables to prefer. However, Mellor J held that he was looking to "*something more concrete in terms of demonstrating why these documents would be relevant to the issues that the trial judge will have to decide*" (e.g., an expert explaining how these documents might make a real difference to their analysis), and he considered that in the application before him there was "*nothing of that nature, just largely the same generalities as before*".

65. I will come back to this later in this judgment when addressing ZTE's submissions on drawing adverse inferences.

Parallel litigation

China

66. On 23 December 2024, ZTE commenced proceedings in the Chongqing Court. As mentioned in the introduction to this judgment, in the Chongqing proceedings ZTE seeks a determination of the terms of a global FRAND cross-licence between the parties covering the entirety of their respective portfolios of cellular SEPs.

67. On 16 January 2025, ZTE commenced two actions for infringement in the Intermediate People's Court of Hangzhou (the "**Hangzhou Court**"), which were subsequently transferred to the Chongqing Court.

68. On 24 January 2025, Samsung challenged the personal jurisdiction of the Chongqing Court. That challenge was rejected by a judgment of 4 June 2025. Samsung's appeal against that judgment was dismissed by the Supreme People's Court of China on 30 July 2025.

69. On 28 February 2025, Samsung commenced two patent infringement proceedings against ZTE in the Hangzhou Court, which were subsequently transferred to the Chongqing Court.

70. Over September and October 2025, the Chongqing Court held a FRAND trial and at the time of this judgment, the result is awaited.

Germany and UPC

71. On 20 December 2024, Samsung initiated anti-trust proceedings against ZTE in the Frankfurt District Court. This was heard on 4 February 2026, with a decision given on 25 February 2026 rejecting Samsung's claim. I have received some further details since but there are significant confidentiality issues with the Court's judgment and in any case from what I have seen I can tell that the reasoning was largely based on issues concerning ZTE's positive top-down analysis (i.e., akin to what it used to get to its $731m offer), which is not part of the case before me.

72. On 1 January 2025, ZTE commenced three patent infringement proceedings seeking unqualified injunctive relief, one in the Munich I Regional Court and two in the UPC LD Mannheim. On 10 January 2025 and 9 July 2025, ZTE commenced two further actions for infringement in the Munich I Regional Court.

73. On 28 February 2025, Samsung commenced three patent infringement proceedings seeking unqualified injunctive relief; a counterclaim in the Munich I Regional Court proceedings brought by ZTE and two claims in the UPC LD Mannheim. On 6 March 2025 and 25 March 2025, Samsung commenced two further claims in the Munich I Regional Court.

74. Both parties have also brought invalidity proceedings in the German Federal Patent courts in respect of the patents that are the subject of the infringement proceedings in Germany.

75. On 14 July 2025, the Munich I Regional Court handed down a Note which was made under the heading of these infringement proceedings but concerned setting out more generally that court's understanding of the *Huawei v. ZTE* requirements and the FRAND defence.

76. A hearing of one of the infringement proceedings before the Munich I Regional Court (in which ZTE asserts that Samsung infringes EP(DE) 2,375,827) took place on 13 February 2026. The decision from that hearing was scheduled to be given on 15 April 2026 but a decision was, I understand, deferred pending a validity decision in the Federal Patent courts.

77. A hearing concerning one of ZTE's claims in the UPC proceedings took place on 18 March 2026. I do not understand there to have been any decision yet material to my task at the time of this judgment.

78. A hearing of one of the infringement proceedings before the Munich I Regional Court (in which Samsung asserts that ZTE infringes EP(DE) 3,580,883) took place on 25 March 2026. The Court dismissed that action as currently unfounded.

79. During the trial I heard some submissions about [REDACTED CBP] in relation to these foreign proceedings in respect of its expected financial liabilities to ZTE under any eventual FRAND licence. [REDACTED CBP], but as matters have turned out it has not been necessary for me to go into this. There was also a procedural argument during trial about the use of submissions to me about

[REDACTED CBP] in the German proceedings, which I ruled on, but which has no impact on the subject matter of this judgment.

Brazil

80. On 15 January 2025, ZTE commenced an action for infringement in Brazil. On 23 January 2025, ZTE obtained a preliminary injunction against Samsung in Brazil. An appeal was heard on 19 March 2025, and on 4 February 2026, the Brazilian Court of Appeal handed down judgment maintaining the preliminary injunction against Samsung.

US

81. On 25 February 2025, Samsung brought anti-trust proceedings in the US District Court of the Northern District of California. On 30 January 2026, the District Court granted ZTE's motion to dismiss these proceedings.

CONDUCT OF THE TRIAL

82. The trial proceeded smoothly, although it was necessary to sit in private quite a lot. Sitting in private was further complicated by the fact that the parties' representatives were in differing confidentiality clubs by subject matter (for example, Samsung's client personnel were not permitted access to materials concerning the ZTE-Apple negotiations) and had to shuttle in and out of court at different times. This did not cause too much difficulty in the end, though.

83. I gave access to remote links to enable various other client personnel, foreign legal representatives, interested parties and journalists to watch proceedings. By the arrangements of the parties, for which I am grateful, multiple links were used so an appropriate one could be shut off and the other maintained when sitting in private. This avoided having to check the identity of individual persons on links when going into private and saved time and complication.

84. I am especially grateful to the personnel at the parties' solicitors who maintained the bundles, an even more difficult and thankless task than usual because of the very complex confidentiality situation.

85. All Counsel played a part in the oral advocacy, which was concise, timely and very helpful. In keeping with the spirit of the guidance in the Patents Court Guide, both junior Counsel took on significant tasks in the oral advocacy, with Ms Osepciu conducting part of the cross-examination of Dr Lopez and Mr Eustace cross-examining Dr Baron.

86. Following discussion with Counsel, the time for oral closing submissions was extended to three days, which I found extremely helpful.

PRINCIPLES APPLICABLE TO ASSESSING (F)RAND ROYALTIES

87. There have been three FRAND licence determinations in the English Courts to date. Chronologically, *Unwired Planet v. Huawei* [2017] EWHC 711 (Pat)

("***UPHC***"), *InterDigital v. Lenovo* [2023] EWHC 539 (Pat) ("***InterDigital HC***"), and *Optis v. Apple (Trial E)* [2023] EWHC 1095 (Ch) ("***Optis HC***"). All three have been scrutinised at the appellate level. *Unwired Planet v. Huawei* reached the Supreme Court ([2020] UKSC 37 ("***UPSC***")) and a hearing in *Optis v. Apple* is scheduled to take place in the Supreme Court in June/July this year. There was a trial for a fourth such determination in *InterDigital v. Oppo* but the parties in that case settled before judgment was handed down.

88. The parties are largely agreed as to applicable legal principles to assessing FRAND royalties in this case. I set them out below.

General

89. Each of the cellular SEPs in the respective portfolios of Samsung and ZTE is the subject of one or more declarations made to ETSI, pursuant to clause 6.1 of the ETSI IPR Policy, whereby they are obliged to offer to license such SEPs on FRAND terms to persons wishing to implement the standards.

90. FRAND terms are not defined in the ETSI IPR Policy, but there is now a substantial body of case law addressing what such terms entail. There is a useful summary in *InterDigital v. Lenovo* [2024] EWCA Civ 743 ("***InterDigital CA***"):

> 7. Standards are set by standards-development organisations ("SDOs"), also known as standards-setting organisations ("SSOs"), such as ETSI. SDOs such as ETSI typically have an intellectual property rights ("IPR") policy which requires companies participating in the development of a new standard to declare when technical proposals they contribute are covered by SEPs (or, more usually at that stage, applications for SEPs). A patent is said to be standard-essential if implementation of the standard would necessarily involve infringement of the patent in the absence of a licence. Once a proposal is declared to be covered by a SEP, the patentee is required to give an irrevocable undertaking to grant licences of the SEP on FRAND terms. If the patentee declines to give such an undertaking, the proposal is not incorporated into the standard and some other technology is used instead. In this way a balance is struck between the interests of patentees and of implementers. Patentees are ensured a fair reward for the use of their inventions, and implementers are guaranteed access to those inventions at a fair price. This balance is in the public interest, because it encourages patentees to permit their inventions to be incorporated into standards and it encourages implementers to implement those standards. Because standards are global in nature, and are implemented by businesses which trade globally, the obligation to license SEPs on FRAND terms is also a global one.
>
> 8. In order to make IPR policies involving the licensing of SEPs on FRAND terms fully succeed, there are two particular potential evils that must be avoided. Although terminology is not entirely consistent, these evils are generally known as "hold up" and "hold out" respectively. In simple terms, "hold up" occurs if a patentee is able to ensure that a SEP is incorporated into a standard and implemented by implementers in circumstances which enable the patentee to use the threat of an injunction

> to restrain infringement to extract licence terms, and in particular royalty rates, which exceed the reasonable market value of a licence of the patented invention (i.e. treating the SEP as akin to a "ransom strip" of land). "Hold out" occurs if an implementer is able to implement a technical solution covered by a SEP without paying the reasonable market value for a licence (or perhaps anything at all). It will be appreciated that the FRAND undertaking is designed to prevent hold up by giving the implementer a defence to a claim for infringement and hence to an injunction, while the patentee's ability to obtain an injunction to restrain infringement of a SEP by an implementer which is an unwilling licensee should prevent hold out.
>
> …
>
> *FRAND as a process*
>
> 39. Although the expression "FRAND" primarily refers to a result, it has been increasingly recognised since the decision of the Court of Justice of the European Union in Case C-170/13 *Huawei Technologies Co Ltd v ZTE Corp* [EU:C:2015:477] that FRAND is also a process. As can be seen from paragraph 28 above, this point has been endorsed by the Supreme Court. What this means is that a SEP holder is required to behave consistently with its obligation to grant a licence on FRAND terms, and an implementer is required to behave consistently with its need to take a licence on FRAND terms. Thus the SEP holder should not behave in a manner which promotes hold up, and the implementer should not behave in a manner which promotes hold out. On the contrary, both parties should attempt in good faith to negotiate terms which are FRAND.
>
> *Willing licensor and willing licensee*
>
> 40. It is common ground that FRAND terms are those that would be agreed by a willing licensor of a portfolio of SEPs and a willing licensee of that portfolio. The concepts of a willing licensor and a willing licensee are very well established in the field of intellectual property licensing, and it is unnecessary for present purposes to elaborate upon them. In the present context, for the reasons given above, a willing licensor is one not intent on hold up and a willing licensee is one not intent on hold out. Because FRAND terms are those that would be agreed by a willing licensor and a willing licensee, it is immaterial whether the SEP owner in question is in fact willing to license on those terms or whether the implementer is in fact willing to take a licence on those terms: such willingness only affects the availability of an injunction once the court has determined what terms are FRAND. Still less is it relevant whether the SEP owner or the implementer has previously acted as a willing licensor or licensee.

91. I also found helpful the following from *Optis v. Apple (Trial E)* [2025] EWCA Civ 552 ("***Optis CA***"):

> 53. This lengthy sub-section [*in the judgment of the trial judge*] contains discussions about the meaning of FRAND, some economic concepts and

references to case law. Some of the material has been stated in other cases and is uncontroversial but there are a number of statements here which I do not agree with, such as the suggestion at [439] that there is "very close alignment" between a price that exceeds FRAND and a price that infringes a Chapter II prohibition. However save for two points this section no longer matters and there is no need to address it further. The first point is the suggestion that the FRAND question concerns value "to the implementer" (see the emphasis in [452](vi) and (vii)). The question primarily concerns value to implementers in general, and it is also relevant to take the particular implementer's circumstances into account in some respects. So, in this case, it is appropriate (and no longer contested) that for Apple with a high selling price which is not derived from the standards, a FRAND rate is not derived in *ad valorem* terms but is an amount of money, as the judge identifies at [452](vii). However in the end the valuation exercise is not concerned with a particular implementer, it is concerned with the value of the licensed property itself.

…

118. In my judgment the distinction drawn is unhelpful and led the judge into error. When one is explaining the reasons why the FRAND system has been introduced, part of that explanation involves the identification of the twin concepts of hold up and hold out. In the language of the Supreme Court in *UPSC* hold out is a "mischief" ([10]). Furthermore at [12] the Supreme Court describes the purpose of the FRAND undertaking given by a SEP holder as being to *protect* (my emphasis) implementers and ETSI from hold up, while [59] also explains there is a balance: to protect implementers from hold up and SEP holders from hold out. In other words both hold up and hold out are behaviours by one party, mischiefs, which the other party is to be protected from; and this underpins the FRAND system itself. However each is plainly a matter of degree and this use of negative language is different from the question whether either mischief is intrinsically unlawful or illegitimate. In this context that is an irrelevant question. In a claim for breach of competition law such as abuse of dominance, it may well be that an act of hold up could itself be unlawful but although an allegation of that kind was made in this case, it is not the context in which this debate arises.

119. The relevant context is the court's task of identifying a rate which is FRAND. As a matter of principle that is a rate which a willing licensee and willing licensor would agree. This is an idealised legal standard. Willing licensees do not engage in hold out to any degree and willing licensors do not engage in hold up to any degree either. Neither party needs to be protected from the behaviour of the other. By contrast real parties negotiate as hard as they can. The purpose of the willing licensee/willing licensor standard is not to measure the legitimacy or illegitimacy of a party's conduct in negotiations. A finding that a degree of hold up or hold out was involved in a given real negotiation is not a finding that either party has acted in an unlawful manner. It is simply a finding that that outcome cannot be taken as the FRAND rate. It may be close to it or far

> away, and if a view can be taken about the degree of hold up or hold out involved that might shed some light, but these are different issues.

92. Thus, for it to require adjustment in rates, "hold-out" need not necessarily imply unlawful or improper action on the part of the licensee, rather what matters is whether conduct or circumstances were non-FRAND. The terms "hold-out" and "hold-up" in this field are often used to imply wrongdoing, though, and to try to avoid this I think the more neutral term "non-FRAND" is useful.

93. As to the non-discrimination limb of FRAND, Samsung argues that ZTE should be held to the rates in the 2021 PLA and ZTE-Apple 2020 in order to avoid discrimination against future licensees, which includes Samsung. There was some suggestion by ZTE that the non-discrimination limb in FRAND is to correct for *any* future discrimination (i.e., including against itself), and that consequently ZTE should not be held to sub-FRAND rates that it entered into in its previous licences. Assessing for non-FRAND factors in previous licences is of course a key exercise when assessing for comparability of those licences. However, as has been made clear in the case law, the non-discrimination limb in FRAND is about correcting for discrimination between similarly situated implementers. See the following passage in *Lenovo v. Ericsson* [2025] EWCA Civ 182:

> 137. I would add that the non-discrimination aspect of the FRAND obligation is not about courts being even-handed between SEP owner and implementer. It is about ensuring that the SEP owner does not discriminate between implementers who are similarly situated: see *UPSC* at [103]-[127].

94. As to the role of commercial practice when assessing FRAND terms, see the following passage in *UPSC*:

> 62. The IPR Policy is intended to have international effect, as its context makes clear. This is underlined by the fact that the undertaking required of the owner of an alleged SEP extends not only to the family of patents (subject only to reservations entered pursuant to clause 6.2 of the IPR Policy) but also to associated undertakings, as stated in the declaration forms in the IPR Policy. In imposing those requirements and more generally in its requirement that the SEP owner makes an irrevocable undertaking to license its technology, ETSI appears to be attempting to mirror commercial practice in the telecommunications industry. We do not accept the distinction which Huawei draws (in its third submission above (para 53)) between voluntary agreements which operators in the telecommunications industry choose to enter into on the one hand and the limited powers of a court on the other, since the IPR Policy envisages that courts may determine whether or not the terms of an offered licence are FRAND when they are asked to rule upon the contractual obligation of a SEP owner which has made the irrevocable undertaking required under the IPR Policy. It is to be expected that commercial practice in the relevant market is likely to be highly relevant to an assessment of what terms are fair and reasonable for these purposes. Moreover, the IPR Policy envisages that the parties will first seek to agree FRAND terms for themselves, without any need to go to court; and established commercial practice in the

> market is an obvious practical yardstick which they can use in their negotiation. In our view the courts below were correct to infer that in framing its IPR Policy ETSI intended that parties and courts should look to and draw on commercial practice in the real world.

Comparable licences

95. The identification and use of comparables is central to this trial. So it is worth setting out the principles at some length.

96. I start with *InterDigital CA*:

> *Comparables*
>
> 41. It is well established that, in seeking to determine what terms would be agreed by a willing licensor and a willing licensee of an intellectual property right, the best guide, where it is available, is a comparable licence for the right in question. There are three common problems with this exercise. The first is that the different ways in which licence terms are expressed in different licences may make it difficult to compare their economic effects. This may make it necessary to "unpack" the licences to enable comparison between them. This is particularly true where a lump sum rather than a running royalty has been paid. The second problem is that other licences which have been agreed may not be precisely comparable to the licence under consideration. This may make it necessary for adjustments to be made to the terms of most comparable licence(s) in order to arrive at appropriate terms for the licence under consideration. The third problem, which can be regarded as an aspect of the second problem, is that licences relied upon as being comparable may not have been entered into by truly willing licensors and willing licensees, or at least not by willing licensors and willing licensees who were appropriately situated. This may be because the licences have been entered into under some form of compulsion or pressure, or it may be because they were affected by some market distortion which should be disregarded for the purposes of the assessment. See *UPHC* at [170]-[176].

97. The Court of Appeal elaborated in *Optis CA*:

> 35. The other set of findings [*in the judgment of the trial judge*] has an introductory part at [229] and then an important section from [288] to [319]. Starting at [229] the use of comparable licences is identified as a tool. A passage from *UPHC* on comparables is set out (*UPHC* [172] to [176]) which includes a well known quotation about identifying the closest comparable. That quotation was from a patent licence of right case in the Court of Appeal: *Smith Kline & French Laboratories Ltd's (Cimetidine) Patents* [1990] RPC 203 (Lloyd LJ) as follows:
>
> > "The object of the comparability exercise, in this as in any other branch of the law, is to find the closest possible parallel. If there is an exact parallel, there is no point in looking any further. If there are slight differences, an allowance may be made. But once you have

> found your comparables, whether one or more, which enable you to arrive at the appropriate figure, it would surely be erroneous to modify that figure by reference to other cases which are not truly comparable at all, so as to bring the case into line with a predetermined range. This was, with great respect, the mistake which the hearing officer made."

36. To this I will add two short extracts from the longer passage in *UPHC* referred to:

> [173] … In my judgment, if a group of comparables are at least potentially as relevant as each other and are not the same, it is not right to elevate a small subset above the others. That is also not what Lloyd LJ in ***Cimetidine*** said one must do; instead, he said that, assuming there is no exact parallel, once true comparables have been determined one should be careful not to dilute them by reference to other cases which are not truly comparable at all. Mr Bezant's general approach does not do this.
>
> [174] If a group of good comparables corroborate one another then no doubt that is a factor to take into account but equally if apparently good comparables, when properly understood, contain different rates that is also relevant too.

37. I will come back to this issue.

38. Starting at [288] the judge comes to two crucial conclusions. The first is that both parties were wrongly adopting what the judgment called an "exclusionary" approach to comparable licences ([288]-[291]). What this refers to is the approach familiar from previous cases (and referred to by Lloyd LJ in *Cimetidine* and by me in the cited passage from *UPHC*) of picking out the best comparable licences from the pool of available evidence. Picking out the best necessarily leads to what the judge called exclusion of the others.

…

90. The other dimension to this issue is a distinction between the comparability of a licence and the reliability of the evidence arising from it. On a number of occasions the judge referred to the task of unpacking, which the experts undertook, as being to render licences comparable. Of course in a very general sense that is true, but this case has drawn attention to a useful distinction which as far as I am aware has not been identified with clarity before. Comparability in the sense of a licence being a good parallel, as referred to by Lloyd LJ in *Cimetidine*, is primarily concerned with the situation of the parties and the subject matter being licensed. So in a case like this about a FRAND licence for Apple handsets, a licence by the SEP holder of the same portfolio albeit to a different handset manufacturer is likely to be the place to start to identify the best comparable. The extent to which licences are affected by hold up or hold out will also have an impact on their comparability. However this kind of

comparability has nothing to do with whether the licence terms involve lump sums or *ad valorem* or DPU royalties. Thus it can be seen that the accountancy experts are not best placed to express a view about this kind of comparability. Comparability itself will be a matter for the judge to decide based on evaluation of all the evidence, which may well include fact evidence about the situations of the various parties and so on. Unpacking does not alter that sort of comparability at all.

91. On the other hand reliability is concerned with the quality of the information derived from a given licence, perhaps involving unpacking in various respects. With this distinction in mind, unpacking is not concerned with making a licence more or less comparable in the sense I have described it, it is about improving the reliability of the comparison.

92. As an approach, the "comparables approach" is the one described in *Cimetidine*. Therefore the fact either expert adopted a comparables approach on instructions is no criticism. It is an appropriate approach in law. As accountancy experts they might well need to be instructed as to which licences they should consider. They were unlikely to be able to comment on comparability of individual licences as I have defined it, but they could and did comment on the quality of the data which can be gleaned from the licences – in other words they commented on reliability and were entitled to do so. An example to which we had our attention drawn was paragraph 6.51 of Ms Gutteridge's report of 14 January 2022 in which she explained that given the uncertainty in the evidence about certain factors, one of which was past releases, she was unable to adjust for such a factor but could only observe its directional impact.

…

95. Before leaving this topic I will say a bit more about starting from the SEP holder's own licences. I maintain that this is the place to start but that is all it is. Factors like hold out and hold up may well render licences of the same portfolio less good as comparables. In this case there are also licences to the putative licensee (Apple). Such licences are capable of being useful comparables, again subject to hold up and hold out, but using them also involves a further dimension which is why, although they may well be useful in the end, they are not the best place to start. Their comparability (not reliability) also depends on the relationship between the patent portfolio being licensed and the SEP holder's portfolio. Not only does one need a view about stack shares, the issue of portfolio quality arises. It is not enough to render them comparable to say that the SEP holder's portfolio is average. The other licensed portfolios also have to examined.

…

114. Whether adjusted as Apple submits or not, the judge's approach is an example of exactly the technique which Lloyd LJ warned against in *Cimetidine* because it involves using less good comparables to modify

> a result from better ones. In my judgment it is flawed. I would therefore allow the appeal on ground 1 and reject respondent's notice ground 1.

98. [95] is a paragraph on which I heard a good deal of argument. I do not think it is especially complicated, though, and I found it quite clear. There is a preference to use the SEP-holder's licences, but they may have problems, in which case reference to the licensee's comparables may be made, recognising that because they are to a different portfolio they pose an inherent challenge, within which one issue will be portfolio quality. I return to the last two sentences when I deal with burden of proof, below.

99. I found the following statement from *UPHC* [174], referenced in [41] of *InterDigital CA* and [36] of *Optis CA*, useful:

> 174. If a group of good comparables corroborate one another then no doubt that is a factor to take into account but equally if apparently good comparables, when properly understood, contain different rates that is also relevant too.

100. It was common ground that where a candidate comparable differs in a material way from the licence under consideration, either because of different circumstances or because of non-FRAND factors, the Court can make adjustments. It was also common ground that such adjustments can be done by objective calculation, such as for portfolio size, or by the Court's more subjective assessment, such as the allowance the Court of Appeal made in *InterDigital CA* for the non-FRAND loss of payment for past royalties in the Lenovo comparable (at [317]). Of course, where a subjective assessment is made it has to be guided by an appreciation of the surrounding circumstances, and in my view the lower the confidence the Court has in being able to make such an adjustment and the greater the likely size of the adjustment, the less likely it is to be appropriate to use the candidate comparable at all.

Top-down methodology

101. This methodology and its limitations have recently been summarised by Birss LJ in *Optis CA*:

> 19. So far what I have described of the arguments represents an approach which has been called "bottom-up" in other cases. The expression is used to contrast with another approach known as "top-down". The top-down approach starts from a figure representing the amount to be paid for licensing all the patents essential to the standard, known as the patent stack. That figure can be called the royalty stack. Then a figure is taken for the patent stack share representing the proportion of the stack of SEPs attributable to a given licensor. The amount due to that licensor is derived simply by assigning the relevant share of that royalty stack to that licensor. Estimating the stack share is not easy but can be done to some extent, and it is sensitive to errors especially for small stacks. However a much more serious difficulty with this approach is how to find the starting point for the royalty stack itself. In *UPHC* I looked at public statements made by various technology companies at [263] - [269] and identified the

> difficulties with that as an approach ([269]). I also observed that if one tries to identify a total royalty stack based on comparable licences, the top-down approach is not independent of a bottom-up approach and would still depend on factors such as unpacking ([270]).
>
> 20. However in *UPHC* I did use this kind of thinking as a cross-check. If one has a figure for a licensor's stack share and a figure for the royalty to be paid to that licensor, you can combine the two to derive the total for the royalty stack which is implied. I believe that approach can be useful provided it is kept in its place. To take an obvious example, if the implied total royalty stack was 50%, that would show the proposed royalty was plainly untenable (assuming one is content with the stack share). In *UPHC* I noted that the IP High Court in Japan had adopted 5% as an aggregate royalty stack ([472]) and on the facts in *UPHC* the aggregate royalty burden was 8.8%. In the USA in *TCL v Ericsson* (2018 US Dist LEXIS 234535 (Selna, J) the figures were 6%-10%. In the more recent *InterDigital v Lenovo* Mellor J at first instance found that the per unit royalty he had arrived at implied an aggregate royalty of 1% and rejected a top-down cross-check analysis as inconsistent with the result based on comparables. On appeal the Court of Appeal increased the royalty by about 30% (from $0.175 to $0.225). At [286] Arnold LJ referred to the top-down cross-check, in a passage the other judges (Nugee LJ and I) agreed with. The point being made was that a comparables analysis is a much more reliable basis for estimating FRAND than the top-down cross-check in that case. Nevertheless, as Arnold LJ also observed, the increased rate arrived at on appeal was less inconsistent with the top-down analysis.

102. This makes clear that the top-down approach still depends on unpacking, and is, in the circumstances Birss LJ was considering, only a cross-check. In the present case it is only deployed by ZTE that way, in any event. It is clear from *InterDigital CA* at [285]-[286] that the Court may, having tried the top-down approach as a cross-check, still proceed on the basis of a comparable which gives a relatively low aggregate royalty stack, in particular if, on balance, the reliability of the comparable is relatively high and that of the top-down method relatively low.

The FRAND range and the broad axe

103. I was assisted by both parties as to how to apply the principles of the "FRAND range" and the "broad axe" as referred to in previous Court of Appeal decisions.

104. I was taken to the following passages from Arnold LJ's judgment in *InterDigital CA*:

> 267. The next point is that it will be recalled that a range of terms may all be FRAND, but InterDigital is only required to licence its portfolio on the FRAND terms which are most favourable to itself (paragraph 33 above). It could be said that, in those circumstances, each side bears the burden of establishing the end of the range which it relies on.

…

275. The third flaw in the judge's reasoning is that he seems to have lost sight of the points that (i) the court's task is to estimate what rate would be FRAND for Lenovo, which is not a task that admits of the kind of mathematical precision which the judge applied, and (ii) a range of rates may be FRAND, and the SEP owner is only required to offer the FRAND rate most favourable to itself.

105. I was also taken to the following passages from Birss LJ's judgment in *Optis CA* (emphasis added):

128. In my judgment given the various concessions identified above and the conclusions reached so far, it is not necessary to remit this case for a retrial. Against the background I have described this court is in a position to reach a just conclusion on the FRAND rate starting from the position of identifying the potential comparables in issue and analysing them by putting them on a common scale of some kind by reference to the stack share under licence in each case, as determined by the Innography data. Expressed in this way, this is the core of the judge's approach below and to that extent it is not now criticised by either party (although Optis contends there is only one comparable - Google). The difference now is to adopt this approach using the DPU data produced by the experts, which the judge wrongly rejected. A convenient common scale to use for analysis is the rate in DPU which a given licence would imply *pro rata* for a licence of a 0.38% stack share. That 0.38% is the stack share applicable to a licence from Optis to Apple bearing in mind the recent Ericsson licence. The exercise is not as complicated as it might seem. It will involve a broad axe - as it always would have done if the judgment had approached this matter the right way - but that arises in any event.

…

143. The question therefore is where to go down from $0.27 DPU. There are two considerations. The first is that if and to the extent there could be a range of FRAND rates, then the patentee is entitled to the top of that range. The second is that the nature of the evidence here does not justify fine distinctions. The realistic options are a DPU of $0.20, $0.15 or $0.10. The last one ($0.10) is clearly too low because it is too far from the Google licence and [*XAB*].

144. I wondered about a DPU of $0.20 per unit for Optis. The grossed up stack price this would imply would be just over $50 ($0.20x(100/0.38)=$52.63). To gauge its significance I will compare that implied total stack price not only with the Google ASP of $470 per unit but also a figure of $625, which I take as representative of Apple's ASP in the earlier part of the relevant period (see Ms Gutteridge's table at Appendix 6.2a (Bundle X/1)). A total stack price of $50 would be 8% of the price of this earlier relevant representative Apple ASP and 10.6% of the price of a $470 phone. That shows that $0.20 per unit is still too much.

> 145. In my judgment $0.15 per Apple unit for Optis is FRAND. I reach that conclusion based on using Google and also Ericsson/InterDigital/Nokia/Sisvel as the best comparables, recognising that they are not similarly situated and that there would appear to be degrees of hold up and hold out involved. As a cross-check, grossed up it would imply a total DPU stack of just under $40 ($0.15x(100/0.38)=$39.47) which would make the total stack 6.3% of the earlier relevant representative Apple ASP of $625 (and 3.9% of a more current Apple ASP of $1000). It would be 8.4% of a $470 Google ASP phone.

106. As to the broad axe, Samsung submitted that all that Birss LJ can have been referring to at [142] is the need to avoid an insistence on precision getting in the way of FRAND compensation. Samsung said that it cannot be a presumption that operates in favour of one or other party when it comes to uncertainties in the unpacking exercise, particularly when even in damages cases there is an unresolved question as to whether the broad axe principle always operates in favour of the claimant or the defendant (referring to *Mastercard v. Merricks* [2020] UKSC 51 at [53]). Samsung made the obvious point that in FRAND cases, there is not really a direct analogy with a claimant or defendant in a damages case, given that the exercise here is one in relation to a licence that one or both party is to grant to the other. ZTE by and large agreed with Samsung's position on this.

107. There is however a dispute as to the FRAND range principle. Samsung submitted that the right to choose is only engaged if the Court adopts the approach of identifying a FRAND range, rather than adopting the approach that has previously been taken in these rate determination cases of settling a FRAND figure. Samsung also drew my attention to the fact that this is a cross-licence case where Samsung is, as part of these proceedings, licensing its own large portfolio and is a SEP owner suing in its own right, and thus has its own right to choose. Samsung acknowledged that in *Nokia v. Oppo* (see e.g., [2023] EWHC 1912 (Pat) at [271]; see also *Lenovo v. Ericsson* [2024] EWHC 846 (Ch) at [80]) there was an assumption made that the right to choose would lie with the net licensor, but Samsung contended that that was not a topic of any detailed consideration or reasoning in that case. In any event, Samsung contended that the proper role of the FRAND range is not to function as a reason for the Court to err in favour of ZTE whenever there is any uncertainty in the unpacking and repacking exercise.

108. ZTE's position on the FRAND range is that it is implicit in the above Court of Appeal decisions that it does have a role to play where there is uncertainty in the unpacking and repacking exercise. In summary, ZTE's argument was that where the Court is at the stage of asking itself what would be the FRAND answer to an area of uncertainty when unpacking and repacking a particular licence, if the Court were to consider two (or more) options to be FRAND, then ZTE is entitled to offer a licence based on the option that is most advantageous to it out of those FRAND options. For example, if there is a dispute between which forecast reports to use when unpacking and repacking the relevant comparable(s) (which there is in this case) and if I were to find that the positions taken by the parties on that issue are both FRAND, then the licensor is entitled to offer a licence based on its position on that matter. I agree with ZTE's position on this particular example

because it reflects a genuine choice by the patentee as to which terms it wants to give (though I would have found for ZTE on the point anyway, since its position was also objectively stronger without the need for it to rely on any ability to choose).

109. I also think that the FRAND range can have a legitimate potential effect at the stage of global assessment of the actual FRAND rate, as with [143]-[145] in *Optis CA* above, but I do not think that the FRAND range concept involves that at every disputed stage of a multi-part analysis the Court should take the patentee's position in preference to the implementer's so long as it is arguable. That could easily have a compounding effect where the eventual number is not FRAND. I understood ZTE to accept this. I also think that while it is legitimate for the Court to give weight to the patentee's right to choose the top of the range that does not necessarily compel the Court to treat it as a trump card if other more objective factors are available, and so for example in *Optis CA* as cited above, Birss LJ preferred $0.15 even though the top of the range in a sense was $0.20.

110. In the end and given the analysis I have gone with, the FRAND range issue does not really matter anyway, because ZTE did not argue by way of top of a range on any of the important numerical inputs to the result (it prevailed on the forecast data point in any event).

The stage at which to apply economic adjustments

111. The parties also addressed me on the stage at which I should apply adjustments to the rate derived from the comparables, if I consider that there were e.g., any non-FRAND factors in those licences or other factors which mean that those licences are not precisely comparable to the CDL.

112. The issue is whether the Court must determine precise numbers to be derived from a licence and then adjust (i.e., a staged approach) or whether the Court can take a more holistic approach. Samsung said that there is nothing in the authorities which specifically requires either approach but took me to a passage in *InterDigital CA* ([268] which I reproduce later in this judgment in the context of arguments on burden of proof) that describes a staged approach. ZTE did not seem to take issue with Samsung's submission on this and in my view there is no rigid answer.

THE WITNESSES

113. Neither of the parties criticised the manner in which any of witnesses gave evidence. All the witnesses that I had the opportunity to hear were generally clear, helpful, and did their best to assist this Court with the matters that fall within their knowledge and expertise.

Fact evidence

114. Samsung called Mr Hojin Chang, Licensing Team Leader and Executive Vice President at Samsung who has held a senior licensing role at Samsung since 2014. Mr Chang's written evidence (**Chang 1** and **Chang 2**) was focussed on the

negotiations of the 2021 PLA, although he was cross examined on a broader range of topics than those addressed in his written evidence.

115. ZTE called Mr Xin (Marco) Tong, Deputy Director of the IP Department at ZTE. Mr Tong gave written evidence (**Tong 1**, **Tong 2**, **Tong 3**, and **Tong 4**) and was cross examined on the negotiations of the ZTE licences relied upon in this case, particularly the Big Two.

116. Samsung also put in a witness statement from Mr Youngho Kim, Principal Engineer, Licensing, at Samsung. Mr Kim gave written evidence (**Kim 1**) on the locations of Samsung's manufacturing of cellular-enabled devices and infrastructure equipment. At the PTR, ZTE confirmed that it was not going to cross examine Mr Kim and thus his written evidence stood unchallenged.

Expert evidence

117. As to licensing practice, Samsung called Ms Taraneh Maghamé (written evidence comprising **Maghamé 1** and **Maghamé 2**) and ZTE called Mr Peng (Paul) Lin (written evidence comprising **Lin 1** and **Lin 2**), both of whom were cross examined. These experts also produced a Joint Expert Statement on licensing (**JS Licensing**).

118. For valuation and economics, Samsung called Dr Mario Lopez (written evidence comprising **Lopez 1**, **Lopez 2**, **Lopez 2 Addendum**, and **Lopez 3**) and ZTE called Dr Avantika Chowdhury (written evidence comprising **Chowdhury 1**, **Chowdhury 2**, and **Chowdhury 3**), both of whom were cross examined. Both experts also produced a Joint Expert Statement on valuation (**JS Valuation**).

119. For patent counting, Samsung called Dr Justus Baron (written evidence comprising **Baron 1** and **Baron 1 Addendum**) who was cross examined by ZTE. Although Mr Lin and Dr Chowdhury addressed certain points made by Dr Baron, ZTE elected not to put forward evidence from its own expert in patent counting even though it had nominated an expert in the field. Samsung relied on this omission, as discussed further below.

LICENSING PRACTICE EXPERT EVIDENCE

120. The licensing evidence was largely agreed between the experts. I outline some of the key areas of agreement below. I also touch on some of the areas of dispute in this section but expand on them later in this judgment in the context in which those areas of dispute are material.

The FRAND obligation, bargaining positions, and injunction risk

121. The experts agreed that the FRAND framework forms the basis of SEP licensing negotiations. Real parties genuinely and sincerely work to it.

122. The experts generally agreed that there is typically an imbalance in the parties' bargaining positions in any SEP licensing negotiation and that the factors contributing to the imbalance in bargaining positions include the lack of transparency regarding other licences, the scope and strength of the portfolio, risk

of litigation, and the financial and business position of the parties. Mr Lin at times appeared to place a rather greater emphasis on the resources a party has as a key factor, whereas Ms Maghamé placed more emphasis on a licensor having a stronger bargaining position due to availability of injunctions if it chooses to litigate as well as an informational advantage over the licensee with regards to knowledge about the terms of other licences granted to that portfolio. These were differences of emphasis: there was agreement that those were all potential factors.

123. The experts agreed that SEP licensing takes skill, experience, and resources. There was some mild disagreement as to whether experience as a licensee translates into the skills or expertise required of an active outbound licensor. My finding is that experience as a licensee is relevant when it comes to out-licensing but that the functions are not interchangeable, and that in particular the need for a patentee to demonstrate the strength of its own portfolio for out-licensing takes time and a lot of effort to develop.

124. Because SEP licensing is difficult and requires skill and experience, but is undertaken in circumstances of lack of information and information asymmetry, parties sometimes make mistakes and conclude bad deals. I think this has to be borne in mind in assessing the evidence of other licences in this case. It is tempting to think that they all represent "right" answers where the various respective parties arrived at a result which was logical and consistent with other agreements in the market, but that may not be so.

125. As to injunction risk the experts again agreed at a general level but with some differences of emphasis. They agreed that there was a perception that if litigation became necessary, patentees could move swiftly, in about a year or so, to obtaining an injunction in at least some jurisdictions, most notably Germany, and that a FRAND defence was often not meaningfully available. However, it was clear from the licensing experts (and from the facts of what happened in the negotiations the subject of the fact evidence) that patentees do not feel able to move straight to litigation without making significant efforts to negotiate first. And because of the *Huawei v. ZTE* case law there is a sort of checkpoint on litigation: it is understood that litigation cannot be imminent until the patentee sends a formal demand purporting to comply with the requirements of that case law.

126. A difference of emphasis between the experts was how imminent litigation might be seen to be, and which licensing parties could effectively deploy its threat.

127. I find that while in a sense litigation is always a possibility, because patents are monopolies that are legally enforceable, in some cases it would be seen as a long way off and in other cases much closer. The perception of the imminence of litigation varies considerably according to the patentee, for several related reasons. Litigation would be seen as a strong and reasonably close threat when dealing with patentees who had (a) a track record of litigating by bringing infringement claims and getting injunctions, (b) proven "litigation grade" patents, and (c) litigation resources.

128. Litigation resources, it was clear, do not just mean money, though that is important and global FRAND patent litigation is very expensive. They also

include internal litigation teams, relationships with outside counsel, developed strategies, and so on. Ericsson, Nokia and InterDigital were known to have these resources.

129. Based on the expert licensing evidence, but that of Mr Lin in particular, I find that having "litigation-grade" patents is different from *overall* patent portfolio quality. A patentee only needs a small number of litigation-grade patents to present a serious injunction risk, and their strength may not be correlated to the portfolio as a whole.

130. A sort of indirect litigation risk can arise where a patentee in negotiations was able to divest, or to threaten to divest, patents to a non-practising entity ("**NPE**"). The parties would understand that in general an NPE would in due course probably be more willing to litigate.

Comparable licences

131. The experts agreed that comparable licences are the best guide to FRAND value if they are available.

132. In determining the comparability of a licence, factors which must be considered include the similarity of the parties, the patents and products covered by the licence, the geographic coverage of the patents and relevant product sales, and the covered standards.

133. Both experts agreed that where parties are negotiating a renewal licence, the prior licence is a logical starting point for a comparable but Mr Lin said that while a logical starting point, it may not be an ideal comparable, e.g., due to circumstances that were present when the prior licence was negotiated that no longer applied, such as a deficiency in bargaining power. I accept that.

134. The experts also agreed that when considering comparable licences, the fewer adjustments needed to account for differences between the comparable licence and the licence being negotiated the better (with a caveat added by Mr Lin, which I accept, that it is important to recognise that it is not just the number of adjustments that matters; the extent of each adjustment is equally significant). On this point, there was some debate between the experts as to whether renewal licences may be more useful than first licenses for valuation purposes because they are less likely to include past release discounts, early-bird incentives, or other elements purportedly unique to first licenses. I think ultimately it is uncontroversial between the experts that renewal licenses may in some situations be easier to assess and to unpack for this sort of reason.

135. It was clear on the evidence that although comparables are to be preferred for arriving at FRAND where available, they very often are not available during real licensing discussions. Indeed, they usually are not, because of confidentiality restrictions. So the licensor, the patentee, has knowledge of all of its own comparables but cannot share them with the potential licensee, except possibly anonymised or abstracted, and the licensee has knowledge of its own in-licences but also cannot usually share them (and they relate to other portfolios anyway, by definition). One can see in the ZTE negotiations with Samsung and Apple

(discussed later in this judgment) how little information was available on each side and how keen the parties were to know any small piece of information that was to be had, even just whether ZTE had any other out-licences at all.

136. There was some evidence in this context about the use by potential licensees of their own in-licences. Again, there was a difference of degree, which in this instance it is not necessary to resolve. I find that a licensee's own licences might be used by it for internal purposes, e.g. to do a comparison for the purposes of getting management approval by showing that a proposed deal was better than or at least consistent with other licences already entered into, or to assess overall affordability if a rate were to be applied to a whole standard. Use for external purposes (i.e., to negotiate with the licensor) is not at all common because of confidentiality restrictions. Where external use might be attempted, the issue of portfolio comparability would arise. Mr Lin thought it was less of an issue than did Ms Maghamé, but they both agreed that it would have to be considered.

Portfolio quality

137. As to portfolio quality, both experts agreed that during licensing negotiations, analysing claim charts and associated technical discussions is the most reliable way to evaluate portfolio quality. The experts agreed that there was a concept of "battle-tested" or "litigation grade" patents, but for portfolios which had never been litigated it was not relevant and claim charts and technical discussions would be all the more important.

138. The experts are also agreed that frequently, for SEP owners with extensive cellular SEP portfolios, much of the value in handset licences is concentrated in the cellular SEPs rather than in non-cellular patents and that it is not uncommon or commercially unfeasible for parties to agree to a licence that does not cover a SEP owner's entire portfolio.

"Discounts", first licences and past sales

139. There was some debate during the trial as to the use of the term "discount".

140. I thought this was largely an unhelpful argument about terminology. Speaking generally, a "discount" can range from a specific, concrete reduction for a clearly specified reason (such as an invoice for a contractually specified amount which provides for 5% off if paid within 14 days) to a very general subjective sense that a price will be less than it otherwise might have been (to take an example used in argument, a person selling a home might regard anything less than the asking price as a "discount"). There is no greater precision in the FRAND area, "discount" is not a defined term in SEP licensing, and context is key.

141. In principle, the licensing experts agreed that at the start of a SEP licensing negotiation each party presents a position that allows for negotiation to a lower rate (in the case of the licensor) and to a higher rate (in the case of the licensee). Not every reduction in the rates offered by a SEP holder can be considered a "discount" except in the loosest sense; it may just be a reflection that the parties are moving together to agree a price in relation to a particular portfolio.

142. All that said, the licensing experts agreed that it is not uncommon for licensors to offer first licence "discounts" when initiating a new licensing program. This means indicating to the potential licensee that the licensor is willing to take less than it would want for the same portfolio if it already had a licensing track record, or less than the portfolio and underlying technology would objectively be worth. The incentive for the patentee is to validate its licensing program, and, confidentiality permitting, to encourage other licensees. An "early bird" discount means offering a lower price for early payment; it may be rather more objectively stated (x% off if paid by date y) and it may be offered by established licensors as well as new ones.

143. A major issue in relation to the amount of the CDL in this case is in relation to past sales. This refers to whether, in a negotiated FRAND licence, the licensee pays in full (compared to future sales), or at all, for sales already made. It is clear that in a lot of instances, past sales will have been going on for many years. It is also important to understand that past sales may be time-barred by limitation periods, or not.

144. The experts agreed that licensors do very often take less for past sales, whether or not it is described as a "discount". From their evidence and from the licences in the case, I find that the licences which result may well not be phrased in terms of a percentage reduction, even if negotiations were framed that way, but rather just as a period of past release, and the licence may not allocate a lump sum between the past and future, leaving it unclear what any "discount" was (the lack of clarity allows both sides to take different positions later about what the headline rate was, as was clear in *InterDigital v. Lenovo*, for example).

145. The experts disagreed as to size of such discounts, although they appeared to agree, and I find, that there was no accepted standard. Mr Lin considered it to be widely understood in the industry that past sales are often either completely or substantially discounted, whereas Ms Maghamé said that the extent of any such discount would depend on the specific parties to that particular negotiation and in any event she took a more conservative approach than Mr Lin's "completely or substantially". Ms Maghamé accepted that she had seen 50% discounts; she was asked about whether she had had experience of 80% discounts, but her answer there was ambiguous. I discuss this further when considering the treatment of past sales in the section of this judgment on unpacking and repacking issues, but based on Mr Lin's evidence and my overall appreciation of the actual licences in this case, I conclude that in some instances at least licensors in relatively weak positions give up substantially all past sales.

146. The experts agreed that it was understood that first licences for new licensing programs may set a benchmark, so there is a lot at stake for new licensors if they settle too low: the decision can have a major effect for future rates as well as the first licence.

Top-down methodology and caps

147. The experts agreed that a top-down approach to setting FRAND rates may be discussed during negotiations. Posited examples include where a licensor without comparable licences may use a top-down approach as a starting point to justify

prices sought by reference to portfolio size and will typically specify what they consider the aggregate royalty burden ("**ARB**") should be, whereas a licensee may do a top-down analysis as a cross-check e.g. for affordability.

148. However, neither expert suggested that either party would solely rely on ARBs. The highest Mr Lin put it was that when determining a portfolio royalty rate, having more data points is beneficial because each methodology has its own limitations.

149. Ms Maghamé considered previous court-decided ARBs to have limited applicability in negotiations, because in her view the percentage model means nothing without knowing what it is that it is being applied to, given that they are decided under different royalty bases (see further below in relation to caps). Further, Mr Lin, in cross-examination, accepted that evaluation of stack shares is heavily contested, may fundamentally differ from region to region, and a relatively small change in the stack share can have a big impact on the implied total ARB.

150. Ultimately, I do not think there was much separating the licensing experts on the role of the top-down approach in negotiations. While ARBs may form a starting point in negotiations, parties will quickly move away from them to discuss other approaches such as claim charts and comparable licences where available.

151. In any event, the experts agreed that a calculation of an implied ARB would typically employ a per-handset price cap as part of the analysis, as there are many important features in handsets that have nothing to do with cellular connectivity. The experts also agreed that there is no single cap agreed among the industry players, and no agreement as to whether the cap should be applied to the phone price as opposed to some smaller unit price such as the chipset. Mr Lin's understanding was that the handset cap range, where used, is typically US$200-400. Ms Maghamé considered that the cap would be set at the level of a standard communication device or basic phone and there was some reference to the $200 cap used in the InterDigital 5G and 4G rates.

5G versus 4G

152. There was agreement between the experts that within the smartphone industry the added benefits or improvements offered by 5G over 4G are not nearly as significant as those offered by 4G over 3G and that 5G has not lived up to industry expectations. There was some disagreement whether there was any industry understanding that the 5G rate will be at the higher end of the range for 4G.

153. The experts also agreed that there is no industry consensus as to the multimode weighting for 5G. I discuss this further in the section of this judgment on unpacking and repacking issues.

154. Mr Lin considered that there is consensus in the industry with respect to 4G ARB but agreed that there is no consensus on 5G ARB yet. Ms Maghamé considered that there is no consensus on either, and I agree with her assessment. As to previous court decisions on 4G and 5G ARBs, both experts agreed that they are in fact sometimes referred to during negotiations.

VALUATION AND PATENT COUNTING EXPERT EVIDENCE

155. I will assess the issues within these categories of expert evidence as they arise. The valuation experts were extremely valuable to my task but in the main what they were contributing was numerical analysis based on the many and very complicated data, assumptions and scenarios in play. They were not offering expert input about practice in this industry and while they offered insights based on their economics background (for example on *ad valorem* versus DPU) those were mainly directed at value judgments which are matters for me. They also provided and analysed various public-source data, such as first licence discounts offered by pools, market sales and forecast data and the like, and I have relied on those as appropriate.

PROPOSED COMPARABLE LICENCES – INFORMATION

156. At my request the parties prepared an agreed summary of the proposed comparables (the Big Two, VOX, NHDDS and ENI). It was extremely useful and I have referred to it extensively in preparing this judgment. In the expectation that there are likely to be long and extensive arguments over the confidentiality of its contents and to what extent that confidentiality ought to be maintained I have made it an Annex to this judgment rather than reproduce its contents when I come to the respective licences. I hope this will make dealing with the confidentiality issues easier in terms of the sheer editing involved. In the meantime I have adopted a higher level and more narrative approach to describing the comparables in the main part of this judgment. There will still be confidential matters that need redacting, especially on Samsung-Huawei 2022 where the issues that need discussing to reach my conclusions are detailed.

COMPARABILITY OF ZTE LICENCES

157. [REDACTED EEO/CISZ]

158. Although the licence with Apple was entered into before the 2021 PLA there is significant overlap in the period during which those two licences were negotiated.

159. I deal with the parties' arguments on comparability of the 2021 PLA and ZTE-Apple 2020 first before turning to their respective position on the VOX licences.

2021 PLA and ZTE-Apple 2020, the "Big Two"

160. Details of the Big Two appear in the Annex to this judgment. As I have indicated above, Samsung relies on them as the most probative comparables in this case.

161. First, Samsung points to the fact that it is common ground between the parties that it is the value of ZTE's portfolio to Samsung that will largely drive the lump sum under the CDL, as Samsung will be the net payer due to its sales of mobile phones being much higher than those of ZTE. The experts were in agreement that the overwhelming driver of the balancing payment would be the value of ZTE's portfolio.

162. Secondly, relying on what was said by Birss LJ in *Optis CA* at [90] and [95] (reproduced above), Samsung's position is that the best guide to the terms that would be agreed by willing negotiating parties seeking to conclude a licence to a portfolio is a comparable licence to the portfolio in question. Samsung further argued at trial that this is in accordance with the practice agreed between the licensing experts, namely (i) in determining comparability of a licence, certain factors must be considered, for example, the similarity of the parties, the patents and products covered by the licence, the geographic coverage of the patents and products, and the covered standards, and (ii) when considering comparable licences, the fewer adjustments needed to account for differences between the comparable licence and the licence being negotiated, the better. I note that although Mr Lin agreed with these general statements, he added that the circumstances under which a licence was negotiated may render the licence unreliable as a comparable, and that it is not just the number of adjustments that matter; the extent of each adjustment is equally significant, and I have said above that I agree.

163. Samsung also relied on a line of questioning in cross-examination that led to Dr Chowdhury agreeing that in determining the value of ZTE's portfolio, all else equal, licences under ZTE's portfolio will be better comparables than licences under different portfolios. I agree that using as a comparable a licence to the ZTE portfolio has a significant advantage, but not necessarily a conclusive one, as the case law makes clear.

164. Thirdly, while Samsung disputes that there were any non-FRAND factors that exerted downwards pressure on the royalty rates agreed under the 2021 PLA or ZTE-Apple 2020 it says that if I were to decide otherwise, then those factors can readily be accounted for by making appropriate adjustments when deriving a rate for the CDL. In particular, as to any early mover/first licence discount, Samsung argued based on the written and oral expert evidence that any adjustment should be modest: 5% up to a maximum of 12.5%. Dr Lopez identified 12.5% as the early licensee discount offered by the patent pool Access Advance but also identified Ms Maghamé's evidence noting that such discounts offered by patent pools are larger than any early bird discount which an individual portfolio owner might offer. Accordingly, Dr Lopez proposed that a discount of 12.5% would be likely to be too large if applied in the instant case and that sophisticated players would limit the amount of any discount given, even for early licensees. Thus, Samsung contends that an upwards adjustment of 5% up to a maximum of 12.5% should correct for any early mover/first licence discount if this Court were to consider that such an adjustment is warranted. Some other documents were put to Dr Lopez in cross-examination which referred to various higher "discount" numbers in pool contexts, but he said they were subject to different factors, and they had not been supported by Dr Chowdhury who, when asked, did not put forward anything different from Dr Lopez's 12.5%. I found the cross-examination of Dr Lopez unpersuasive, and if ZTE was going to put forward a cogent case for a higher first licence discount then it needed more support than this. So I proceed on the basis that the top end of the range that is evidenced (although not especially strongly) is 12.5%.

165. Similarly, in closing Samsung also argued that insofar as alleged hold-out impacted on negotiations (which Samsung disputes; see further on negotiations below), and if it manifested in ZTE effectively giving Samsung and/or Apple a discount on past sales, then its unpacking approach to past sales would accommodate for it, or the discount should be assessed as a modest one at most.

166. ZTE accepts that licences to its portfolio need to be considered as a *potential* bases for FRAND analysis, but contends that the Court should be quick to depart from that starting point.

167. First, ZTE contends that [REDACTED EEO/CISZ] focused on 4G functionality, whereas the CDL is to cover 5G functionality over a period where that will be the predominant standard. ZTE contends that [REDACTED EEO/CISZ] or the negotiations that led up to their conclusion were focused on the value of the ZTE 4G portfolio and conducted by reference to 4G claim charts only (the 2021 PLA and ZTE-Apple 2020; see further on negotiation histories below).

168. ZTE maintained this position at trial despite the fact that ZTE-Apple 2020 expressly covers its 5G portfolio on the face of the licence. Samsung argued that both ZTE-Apple 2020 and the 2021 PLA were entered into at a time when 5G had been introduced to the market and was in the full contemplation of the parties. Specifically, on ZTE-Apple 2020, Samsung pointed to the fact that Apple launched its first 5G phone the same day that the licence was signed in October 2020 and so it would have been expected that very quickly Apple's product line would all include 5G. Samsung relied on Counterpoint forecast figures produced by Dr Chowdhury on what parties would have expected at the time of the agreement. Dr Chowdhury was taken to these forecast figures in cross-examination, which show that Apple would have been expected to sell c.$750 billion of 5G devices during the term of the licence, comprising 64% of all sales during that term. Samsung submitted that in these circumstances, the idea that ZTE would have licensed without having regard to the value of its 5G portfolio is absurd.

169. Samsung argued that to the extent that this Court were to consider either of the 2021 PLA or ZTE-Apple 2020 to have undervalued ZTE's 5G portfolio, a percentage uplift can be applied as an adjustment factor.

170. Secondly, ZTE argues that its licences do not disclose a market rate for the ZTE 4G portfolio, as they imply a wide range of royalty rates on either valuation expert's analysis. In particular, ZTE draws my attention to the following facts: (i) the rate that Dr Lopez unpacked from the ZTE-Vivo 2024 licence [REDACTED EEO/CISZ] is [REDACTED EEO/CISZ] than the rate that he unpacked from the 2021 PLA [REDACTED EEO/CISZ], (ii) the rates that both Dr Lopez and Dr Chowdhury unpacked from ZTE-Apple 2020 and the 2021 PLA are below the rates that they unpacked from the VOX licences [REDACTED EEO/CISZ], and (iii) the rates derived by both experts from the 2021 PLA are [REDACTED EEO/CISZ] those derived from ZTE-Apple 2020. This is illustrated in the following table that was included in ZTE's opening skeleton (footnotes omitted), which ZTE says strongly suggests that they cannot all be reliable comparables and are unlikely all to be FRAND.

[REDACTED EEO/CISZ]

171. The above argument largely turns on the VOX licences, so I address them when considering those licences later in this judgment. The differences between the Big Two are heavily affected by the CNS and 5G disputes on the scope of the licence under the 2021 PLA.

172. Thirdly, ZTE argues that there are reasons to believe that the 2021 PLA and ZTE-Apple 2020 were affected by non-FRAND factors and concluded at sub-FRAND rates. I consider the details of both licences' negotiation histories below.

173. Fourthly, ZTE contends that its licences all present significant challenges to unpacking which affect their reliability. [REDACTED EEO/CISZ] This, says ZTE, requires the Court to take a view on the amount of payment (if any) that is made in respect of sales prior to the effective date of the licence in question which will necessarily be speculative. ZTE argues that alternative assumptions regarding the treatment of past sales can make a material difference to unpacked rates. As an illustration, Dr Chowdhury calculated the CDL one-way rate for ZTE based on the 2021 PLA to be [REDACTED EEO/CISZ] if a 50% past sales discount is applied. This figure is increased by approximately [REDACTED EEO/CISZ] if a 90% past sales discount is applied. Likewise, Dr Chowdhury calculated the CDL one-way rate for ZTE based on ZTE-Apple 2020 to be [REDACTED EEO/CISZ] if a 50% past sales discount is applied. This figure is increased by approximately [REDACTED EEO/CISZ] if a 90% past sales discount is applied instead. This implies that the size of any past sales discount issue is very important to the result from either of the Big Two, which I agree with.

174. Samsung said in its opening and closing submissions that since it is common ground that the VOX licences are bad comparables, they are to be disregarded. So, said Samsung, among ZTE's out-licences that leaves ZTE-Apple 2020 and the 2021 PLA. Samsung contended that if and to the extent that there are uncertainties regarding the unpacking of those two licences, they are much more limited than with ENI and do not affect their reliability, and in any event relevant adjustments can be made, e.g., with respect to treatment of past sales.

Negotiation histories of the Big Two

175. The ZTE/Apple and ZTE/Samsung negotiations were often dealt with separately in the evidence and argument at trial, but they overlapped significantly in time and there are some important common themes and factors. In this initial section I identify some of the common matters before looking at each negotiation separately.

176. The ZTE/Apple negotiations began in March 2018 and went on until the licence agreement was executed in October 2020. The ZTE/Samsung negotiations started in September 2018 and went on until the 2021 PLA was executed in July 2021. So, the overall time taken for each was similar, with the ZTE/Apple negotiations starting and ending a little sooner.

177. The two sets of negotiations proceeded essentially independently, although Apple and Samsung each respectively seem to have asked ZTE about its progress licensing other implementers. ZTE was limited as to what it could say because of confidentiality. ZTE was not really able to leverage the fact that it had in fact licensed Apple a few months before it licensed Samsung and so in a sense both deals were made on the basis that they were the "first", or at least that ZTE had no previous out-licence of significance.

178. I bear in mind that for the ZTE/Samsung negotiations I have evidence from the negotiators on both sides whereas for ZTE/Apple I have only ZTE's account. ZTE makes various criticisms of Apple's conduct; I am sure there are two sides to the story and I do not have Apple's.

179. ZTE's approaches to both companies followed a decision in late 2017, when it clearly was severely beset by the US sanctions, to try to license its 4G portfolio to big international implementers to bring in cash. Apple and Samsung were chosen because of their high sales volumes. ZTE's preparations for the negotiations took time because they involved making claim charts and doing royalty market research to support the rates that would be asked.

180. ZTE also looked at licensing Chinese vendors but work on that did not progress well, although I was told that specific discussions with [REDACTED EEO/CISZ] started in March 2018.

181. I find that the effect of the US sanctions was severe at the start of the negotiations and ZTE was relying on its reserves for a significant period. I also find that its handset business had more or less collapsed and did not recover, so it is correct to say that ZTE was reshaping itself in a major way.

182. ZTE's financial position recovered later in the negotiation periods and by about 2020 it had cash and cash equivalents of up to $6bn. I am not sure how this recovery took place when its revenues had been so affected by the US sanctions and its evidence did not make this clear. Possibly it was a result of a healthy remaining Chinese infrastructure operation, but it does not really matter. I find that while ZTE had recovered significantly by then it was still in need of revenue to replace its handset product income and its management continued, reasonably, to feel the need to prioritise getting in cash. This imperative was, I find, passed on to the negotiating teams and they acted on it.

183. ZTE was not inexperienced at SEP licensing and it had personnel with expertise, but until the US sanctions its experience was essentially in in-licensing or cross-licensing to support its handset business. I find that pivoting to an out-licensing operation was a major undertaking (I have mentioned some of the necessary preparations above) and that although it was not a completely one-sided situation, the negotiating teams at Apple and Samsung had a much greater depth of relevant experience. The disparity affected ZTE's ability to get a good deal.

184. ZTE came to both sets of negotiations looking for quick deals and it was a long way from being able to litigate its SEPs if it needed to do so. It was, again, not completely inexperienced at SEP litigation and had counterclaimed in the *Huawei v. ZTE* dispute a few years before, but I accept Mr Tong's evidence that he had

no budget from his management for litigation and ZTE did not have any real appetite for it. It is unclear precisely to what extent this unpreparedness or reluctance was known to Apple or to Samsung, and in the case of each of them ZTE did give some indication of having options outside negotiation, which I address individually below. As a general matter, however, I find that Apple and Samsung both thought litigation (or the divestment of ZTE patents to an NPE) was never at all imminent or likely, and had an awareness that ZTE had not previously ever initiated SEP infringement litigation.

185. I find that in both sets of negotiations, ZTE's initial desire was for a 4G deal, but Apple and Samsung each pressed for the inclusion of 5G. Apple clearly succeeded and on the conclusions I reach about the meaning and effect of the 2021 PLA Samsung largely did as well. Whether ZTE got adequate value for 5G is a major issue which I address below separately for each counterparty.

186. ZTE was aware that any deals it made with Apple or with Samsung would be relevant to its future licensing position. On the plus side it would be of benefit to it to be able to say, so far as it could consistently with confidentiality restrictions, that it had licensed Apple and/or Samsung, or "major handset manufacturers". On the negative side, if it gave low rates out of a need for quick cash those might be potentially damaging comparables in the future, and the shape of the arguments in this litigation illustrates that. Apple and Samsung also appreciated this dynamic, I find, and there is a particular point about [REDACTED EEO/CISZ], which I address below.

187. Samsung, including through the evidence of Dr Lopez, argued that because ZTE must have realised the potential adverse effect of agreeing low rates (or throwing in 5G cheaply), it may be taken not to have done so, so ZTE-Apple 2020 and the 2021 PLA can safely be assumed to represent the true value of the ZTE portfolio. In my view this is the wrong way around. ZTE thought that it may well have to live with the effect of the agreements as comparables in the future, and that it was making deals that undervalued its 5G position, but decided it had to go ahead for other business reasons, most specifically the need for income and to establish its out-licensing business with a couple of big deals. The very significant shortcomings of the deals from its perspective were symptoms of its weak position.

ZTE-Apple 2020

188. After ZTE's initial approach, early in person discussions took place in September and October 2018 and I accept Mr Tong's evidence that he told the Apple personnel that ZTE wanted a quick negotiation and was willing to reflect that in a lower price.

189. [REDACTED EEO/CISZ]

190. [REDACTED EEO/CISZ]

191. [REDACTED EEO/CISZ]

192. [REDACTED EEO/CISZ]

193. [REDACTED EEO/CISZ]

194. [REDACTED EEO/CISZ]

195. [REDACTED EEO/CISZ]

196. I find that ZTE's repeated agreement to Apple's changes to the proposed deals reflected its weak bargaining power. This is in no way a criticism of Apple, it is just a fact.

197. [REDACTED EEO/CISZ]

198. [REDACTED EEO/CISZ]. Apple's response is not consistent with its having been at all concerned and if anything shows its strength, resources, and organisation in licensing matters.

199. [REDACTED EEO/CISZ]

200. I do not think it was a result of [REDACTED EEO/CISZ] or the surrounding circumstances, but by this point ZTE had reduced its offer to [REDACTED EEO/CISZ]. The final deal price was [REDACTED EEO/CISZ]. ZTE had had the opportunity over a period of some months to argue for a price which reflected its 5G position, although it had not had the chance to support its position with real technical detail in the form of claim charts or the like. [REDACTED EEO/CISZ].

201. Given the potential significance of a past sales discount in the unpacking if (as I intend) ZTE-Apple 2020 is used as a comparable, I will make findings relevant to that at this point. My findings are that ZTE thought Apple had made very extensive use that would be covered by its 4G and 5G SEPs. It was justified in that thinking, [REDACTED EEO/CISZ]. To what extent this was because of its bargaining weakness and/or because giving heavy discounts was normal practice is not specifically clear but from all the surrounding circumstances I infer that both played a part and bargaining weakness a major part. In due course and as mentioned above the final deal was structured for a payment of [REDACTED EEO/CISZ] (ZTE having agreed to [REDACTED EEO/CISZ] quite quickly) [REDACTED EEO/CISZ].

202. I cannot infer merely from [REDACTED EEO/CISZ] that no value was given for past sales, especially because I have little to go on about what happened in the later period when [REDACTED EEO/CISZ], but the direction of travel was that ZTE gave up on past sales to a very large degree and perhaps almost completely.

The 2021 PLA

203. Prior to 2018 Samsung and ZTE had been discussing a royalty free cross-licence and later a mutual standstill. The details are not important. This changed as a result of the US sanctions. ZTE needed money, and with no handset business to speak of, any value to a licence from Samsung was no longer material. I regard this as all quite rational and Samsung saw it coming. I also accept Mr Chang's evidence that while Samsung knew ZTE was severely impacted by the US sanctions, it also thought ZTE retained a strong infrastructure business in China.

204. Following the initial approach by ZTE in September 2018 (for a 4G licence) negotiations took a relatively normal course until ZTE made an initial offer in March 2019 for [REDACTED CBP] (still 4G only). Mr Chang in his evidence said that this was ridiculously high. As was the case with Apple, I am sure that ZTE did not think it would get the amount of its first offer, but at the same time deals for significant portfolios with the very biggest handset makers reach well into the hundreds of millions of dollars. In the course of argument about whether the [REDACTED CBP] figure was confidential I remarked to Counsel for ZTE (who had mentioned it in open court by mistake) that it was just a very high opening offer and might as well have been [REDACTED CBP]. ZTE expressed a reasonable concern that I should not become "anchored" to the notion that [REDACTED CBP] cannot be an appropriate lump sum in this field merely because of the historical context of the Samsung/ZTE negotiations I have just mentioned, and I agree. My remark was simply in the context that the opening offer was no more than that and was not expected to be accepted, so its confidentiality could be hard to defend.

205. The witnesses had different recollections about whether the [REDACTED CBP] offer included a past release. I do not need to decide who was right and am not in a position to do so anyway.

206. I accept Mr Tong's evidence that at an early stage, and thereafter, he said to Samsung that in the light of the US sanctions ZTE wanted a quick "settlement" rather than a "detailed FRAND negotiation". Samsung submitted that the word "settlement" implied a dispute and therefore possible litigation. I return to the perceived proximity of litigation below, but I reject the submission about "settlement". Mr Tong just meant a fast, rough and ready bargaining process, omitting at least some of the usual full FRAND process.

207. The parties put appropriate NDAs in place and technical discussions took place. They were all focused on 4G SEPs and claim charts.

208. A meeting took place in October 2019 at which the [REDACTED CBP] was again touched on. I accept Mr Tong's evidence that at this stage he acknowledged that ZTE did not have an out-licensing track record and was willing to offer "discounts". In this context "discount" just meant a lower price than would be obtained for the same licensed patents were it not for the fact that this would be ZTE's first out-licence.

209. At this stage, there was also some reference to the *Huawei v. ZTE* framework. Mr Tong's written evidence was that ZTE said that with technical discussions concluded the parties might, if following *Huawei v. ZTE*, make formal proposals to each other about rate calculations, but that ZTE did not want to do that but instead to "treat the discussions more as a form of settlement". Mr Tong also said that this was an indication that ZTE was not seeking to prepare for litigation.

210. Mr Chang in his oral evidence accepted that Mr Tong had said something along these lines, and that superficially it indicated that ZTE did not intend litigation. But he said that he did not trust ZTE's statements on this point.

211. This is perhaps to some extent just a difference of perception, but my finding is that ZTE did clearly flag that it did not intend litigation in the foreseeable future but wanted a quick deal instead, and while Samsung might have thought that ZTE could litigate at some point (particularly given its participation in *Huawei v. ZTE*), that point was at least a long way off. If ZTE had had any interest in applying litigation pressure it would have sent a *Huawei v. ZTE* letter, and I think Samsung would have realised that.

212. Samsung submitted, based on Mr Chang's evidence, that ZTE could have offered a standstill if it did not intend litigation, but did not. I do not accept the force of this. There was no reason to offer a standstill if ZTE did not intend litigation, and I do not think Samsung asked for one, either.

213. Over the first few months of 2020 the parties inched towards each other: ZTE reduced its offer to [REDACTED CBP] with an early signing price of [REDACTED CBP] if concluded in April 2020, and Samsung increased its offers from [REDACTED CBP] to [REDACTED CBP] and then [REDACTED CBP].

214. The possibility of the deal including 5G appears first to have come up at a meeting in April 2020. The details are not all entirely clear but I accept Mr Tong's evidence as generally correct, at least as to the facts that ZTE said that the addition of 5G would come with a substantial price and that Samsung said that it wanted to add something to the deal without changing the price, to sell the package to its management.

215. Progress then stalled. The parties were too far apart. Mr Tong said that even with the pressure ZTE was under, what Samsung was offering was far too low. I accept this, although I do not think ZTE thought its then-current position was a realistic goal, either.

216. At this point, a company called Innovius became involved, the relevant individual there being the President, Kirk Dailey. Innovius specialised in patent licensing negotiations and brokering.

217. Innovius' involvement is the cause of a good deal of confusion and lack of clarity. It is not clear whether Samsung or ZTE was first in touch with Innovius in the context of their negotiations. It appears likely that Innovius made the first approach, but each of Samsung and ZTE believes that the other was the first to be contacted (and each of Mr Chang and Mr Tong knew Mr Dailey of old). It is not possible for me to resolve this, but neither side submitted that it mattered. Without implying any criticism, I think it was part of Innovius' skill to appear to be a friend to both sides and to maintain a degree of ambiguity.

218. It seems that Innovius' initial idea was to include ZTE in a package of licensors all licensing Samsung. In that case Innovius would have been more truly a broker, but that did not go anywhere and Innovius became a sort of go-between trying to facilitate a bilateral deal between Samsung and ZTE. In the course of submissions at trial it was referred to as a kind of mediator, but it was not a mediator in any true sense because its compensation depended on there being a deal, and it had no formal agreement to be neutral.

219. A further problem arising from Innovius' involvement is that it prepared important documents which did not go to both sides. Most importantly, there was a series of term sheets in December 2020 and January 2021 which only went to ZTE.

220. The 28 December 2020 term sheet was for a 5-year, 4G licence deal with a 3-year standstill on 5G; the standstill was clearly not a licence, just a deferral, as 5G was specifically excluded from the licensed standards. The price was [REDACTED CBP].

221. The January term sheets added a covenant not to sue, first for 2024 and 2025 and later only for 2024. These differed in language from the eventual CNS in the final 2021 PLA. There was no indication that ZTE would never be able to get damages for the CNS periods in the January term sheets.

222. Later versions of the January term sheets replaced the [REDACTED CBP] with a placeholder "XX.X".

223. At some point, the [REDACTED CBP] proposal was increased to [REDACTED CBP]. The circumstances surrounding this are particularly unclear, but that figure was included in a draft PLA of 2 February 2021. Mr Chang's recollection is that Innovius told him in January 2021 that ZTE had licensed one of Samsung's biggest competitors, that he inferred (correctly) that it was Apple, and that "to protect its rate" ZTE would require an additional [REDACTED CBP] from Samsung. Mr Tong said that it was unlikely he said that and he did not recall saying it. I cannot resolve this conflict, especially because of the lack of clarity of what Innovius said to each side. But I do accept what Mr Chang went on to say, which is that he agreed to increase the headline price to [REDACTED CBP] if Samsung got something in return for the "extra" [REDACTED CBP], specifically that ZTE could not later recover payment for the 2024 CNS period.

224. At this point, therefore, the price was essentially agreed. I find that ZTE strongly expected it to be a 4G-only licence (albeit with a 5G standstill), but Samsung had not seen any draft terms, not even in term sheet form, until the 2 February 2021 draft (which in the event reflected ZTE's expectation about 4G). I accept Mr Chang's evidence that he told Mr Dailey to "Just get the money right", and that Samsung would consider the scope of the licence once it saw a draft.

225. After seeing the 2 February 2021 draft, Samsung responded on 17 March 2021 with a mark-up which (a) sought to include 4G/5G "double declared" patents in the scope of the licence, and (b) contained language such that damages for the 2024 CNS period could never be recovered in the future.

226. ZTE objected to both and sent back an amended draft on 1 June 2021. There were further discussions about the wording in these two respects but I am not going to go into them because they are irrelevant in law to the proper interpretation of the 2021 PLA and do not in my view bear materially on the question of whether there were non-FRAND factors at play.

227. ZTE argued that Samsung "proceeded to ambush" it in the March 2021 draft, both in respect of the reformulated CNS and in relation to 5G. I do not think that

"ambush" is a particularly apt word, and as to the CNS, I have accepted above that Mr Chang had agreed to the [REDACTED CBP] increase on the basis that the CNS would be reworked so as to permanently release liability for 2024. It is possible that Innovius did not pass this on effectively, but that is not Samsung's fault if that is what occurred.

228. As to 5G, by contrast, whether or not one calls it an ambush I find that Samsung exploited the fact that ZTE had effectively agreed the price prior to other key terms being sorted out, and forced through the inclusion of most of the benefit of ZTE's 5G SEP patent coverage for no additional payment. ZTE fought a rearguard action in the drafting process to seek to preserve a position on 5G but on my findings about the proper scope of the 2021 PLA the effort was in vain. ZTE must have known that its position as to 5G was shaky even after its drafting efforts, but in my view it felt it had no choice but to accept, as Mr Tong said. Tough negotiating is often not pretty and I do not say that Samsung engaged in sharp practice, but I do accept ZTE's submission that in this important respect it was "pushed around" as a result of its weak position.

229. The fact that ZTE did not get any real payment for its 5G SEP rights in the 2021 PLA is supported by the fact that while the parties had extensive technical discussions about 4G with claim charts and the like, there was nothing of the kind in relation to 5G.

230. [REDACTED EEO/CISZ] ZTE had the benefit of Perkins Coie's services in wrapping up the 2021 PLA, and for the same reasons I do not attach weight to it.

Conclusions on the negotiation histories of the Big Two

231. The price achieved by ZTE in each of the Big Two agreements was affected by the following main factors:

    i) ZTE's severe problems from sanctions, albeit that they reduced over time;

    ii) ZTE's expressed need for cash in return for a quick deal, putting it in a weak negotiating position;

    iii) The need to give a first/early licensee discount in view of a lack of outbound licensing history;

    iv) ZTE's relative inexperience in outbound licensing compared to the very great experience of Apple and Samsung;

    v) ZTE's relative lack of outside options, with litigation never seriously on the horizon and possible sale to an NPE an unlikely and ineffective measure;

    vi) Inability properly to gain value for its 5G portfolio.

232. As to 5G, ZTE was pressed into including it by Apple. It agreed reluctantly but had the chance to negotiate with 5G in the mix, albeit without the means such as claim charts really to show the strength of that part of its portfolio. In relation to the 2021 PLA ZTE was outmanoeuvred by Samsung and achieved minimal if any value for 5G.

233. This difference in the impact on 5G is one main reason why I prefer ZTE-Apple 2020 over the 2021 PLA as the best comparable. The other is that ZTE-Apple 2020 is the cleaner choice because it clearly covers 5G, whereas coverage of 5G by the 2021 PLA is only partial, on either side's case. In addition, a lot of confusion is injected by Innovius and I find it somewhat easier to assess the appropriate past sales discount allowance from ZTE-Apple 2020, though I am clear that in either case it ought to be large. Given the unpacking analysis, it can be seen that on a per-unit basis ZTE achieved a considerably worse result with Samsung than with Apple, and this is consistent with my view on 5G, in particular.

234. At various points in opening and closing, ZTE brought to my attention that in *Optis CA* the Court of Appeal did not rely on ZTE-Apple 2020 even though it had been disclosed in those proceedings and was one of the licences relied on at first instance as part of an averaging approach. Instead, the Court of Appeal relied only on the Apple licences that implied the four highest rates (Apple's licences with Ericsson, Nokia, InterDigital, and Sisvel) and Optis' licence with Google, and even then the Court of Appeal had to make an upwards adjustment to the implied rate. Albeit superficially attractive, on closer inspection I do not accept ZTE's argument on this point. Apple's licences with the ENI parties are different to the ENI licences in this case (i.e., licences where the counterparty net payer is Samsung). Apple's licences with ENI are not before me in this case, so I just do not know how the two sets (Samsung-ENI and Apple-ENI) compare and as a matter of delta how far away ZTE-Apple 2020 sits from the rates implied in Apple's licences with ENI (although I accept that ZTE-Apple 2020 is lower, given *Optis CA*). Also, and importantly, I have found that there were non-FRAND factors at play in ZTE-Apple 2020 and I am going to make major upwards adjustments to account for those factors. So a general "too low" argument does not work.

Unpacking/repacking issues specific to the 2021 PLA – licence scope

235. There are two issues of construction that arise when unpacking the 2021 PLA: (i) whether 5G products sold during the term of the 2021 PLA were partially licensed (Samsung's position) or essentially unlicensed (ZTE's position) (the "**5G Issue**" – I am paraphrasing and simplifying each side's position at this stage), and (ii) whether sales made during the **CNS Period** of 1 January 2024 to 31 December 2024 have already been paid for under the 2021 PLA (Samsung's position) or need to be paid for under the CDL (ZTE's position) (the "**CNS Issue**"). Samsung's position on the CNS Issue entails the CNS Period being included in the licence term when unpacking the 2021 PLA. Given that the 2021 PLA construction issues also affect the number of past sales that must be covered by the CDL, they also affect repacking of any CDL, regardless of the comparable licence(s) used to determine the FRAND royalty.

236. The 2021 PLA is governed by Californian law. However, neither party sought to plead or adduce evidence of foreign law. Samsung said that, in line with *FS Cairo (Nile Plaza) v. Brownlie* [2021] UKSC 45 at [108] to [149], the correct approach in such circumstances is to apply English law in construing the respective contracts. ZTE did not take a point on this and I agree with it.

237. In closings, Samsung attempted to rely on a decision under Californian law as part of the factual matrix, Mr Chang also having made several references to US law as to his position on the CNS Issue. Given that neither side has pleaded foreign law, I do not think I ought to place any weight on the decision.

238. The parties agreed on the basic principles of contractual construction in this case. Namely:

    i) The exercise is an objective one.

    ii) The Court can take into account the relevant factual matrix known to both parties to the agreement at the time that it was entered into.

    iii) Where there is ambiguity, the Court will consider the language used and ascertain what a reasonable person, with the background knowledge of the parties, would have understood the contract to have meant.

    iv) If there are two possible constructions the Court is entitled (but not obliged) to prefer the construction which is consistent with business common sense.

    v) Whilst recitals may be looked at as part of the surrounding circumstances of the contract, clear words in the operative part of an instrument cannot be controlled by recitals.

239. The parties also agreed that it is not permissible to rely on evidence of pre-contractual negotiations for the purposes of contractual construction.

The 5G Issue

240. The grant of a licence under "ZTE Licensed Patents" is as follows:

> **3.1 License under ZTE Licensed Patents:**
>
> Subject to ZTE's timely receipt of the Payment (as defined in Section 4), and subject to the provisions of Section 4.1.1, ZTE, on behalf of itself and its Affiliates, hereby grants to Samsung and its Affiliates, solely during the period starting on the Effective Date and running through December 31, 2023 (the **"License Term"),** a fully paid-up, worldwide, non-transferable (except to the extent permitted pursuant to Section 8.3.2) and non-exclusive license, with no right to grant any sublicense, under the ZTE Licensed Patents, to make, have made, use, import, export, sell, offer for sale, develop, distribute, and/or otherwise dispose of all Samsung Licensed Products, and practice any method in any ZTE Licensed Patent in connection with any of the foregoing authorized activities with respect to any Samsung Licensed Product.
>
> ZTE, on behalf of itself and its Affiliates, agrees that the license granted under this Section 3.1 authorizes Samsung and its Affiliates, as well as their respective customers and other downstream distribution channels, to sell, assign, transfer or otherwise dispose of any Samsung Licensed Product, anywhere in the world, under any ZTE Licensed Patent,

regardless of the jurisdiction in which the first sale, assignment, transfer or disposal of such Samsung Licensed Product took place.

241. "ZTE Licensed Patents", "ZTE Licensed SEPs", "Licensed SEP(s)-1", "Licensed Standards-1", and "5G SEPs" are defined in the contract as follows (I reproduce them out of numerical order and in an order which makes it easier to follow the interaction of the definitions):

> **1.51 "ZTE Licensed Patent(s)"** means any and all ZTE Licensed SEPs and ZTE Implementation Patents. Notwithstanding anything to the contrary herein, once any individual patent claim of a ZTE Patent becomes a ZTE Licensed Patent, such Patent shall continue to be a ZTE Licensed Patent.
>
> **1.53 "ZTE Licensed SEP(s)"** mean any and all Licensed SEP(s) that are ZTE Patents.
>
> **1.20 "Licensed SEP(s)"** means all Licensed SEP(s)-1 and Licensed SEP(s)-2.
>
> **1.21 "Licensed SEP(s)-1"** means any Patent: (a) including at least one patent claim that is Technically Essential to at least one standard of the Licensed Standards-1; or (b) having been declared by its owner to be essential (or potentially essential) to at least one standard of the Licensed Standards-1, regardless of whether any of its claims are actually Technically Essential to any Licensed Standard-1; together with any continuations, continuations in part, divisionals, foreign counterparts, re-examinations, and reissues of any such Patent. Notwithstanding anything to the contrary herein, once any Patent becomes a Licensed SEP-1, such Patent shall continue to be a Licensed SEP-1 including all patents claims therein, even if such Patent also: (i) includes at least one patent claim that is Technically Essential to 5G; or (ii) has been declared essential (or potentially essential) to 5G, regardless of the actual essentiality of such patent to 5G.
>
> **1.23 "Licensed Standards-1"** means the Wi-Fi Standard and the Bluetooth Standard published by IEEE, and the 2G, 3G, and 4G cellular radio access network specifications published by 3GPP and the ITU and adopted by one or more relevant local standardization bodies, such as ETSI, TIA, T1P1, ARIB, TIC and CCSA, in each case irrespective of the transmission medium, frequency band or duplexing scheme. For the avoidance of doubt, the term "Licensed Standards-1" includes other standards normatively referred to in the standards identified above (including AMR-NB, AMR-WB, AMR-WB+, EVS and eSIM), and includes further updates and evolutions of the standards identified above, solely to the extent that any such updates or evolutions do not fundamentally alter the overall technical character of the standard in question; provided, however, that in no case whatsoever shall "Licensed Standards-1" include 5G.

> **1.62 "5G SEP(s)"** means any Patent: (a) including at least one patent claim that is Technically Essential to 5G; or (b) having been declared by its owner to be essential (or potentially essential) to 5G, regardless of whether any of its claims are actually Technical Essential to 5G; together with any continuations, continuations in part, divisionals, foreign counterparts, re-examinations, and reissues of any such Patent. Notwithstanding the foregoing, "5G SEP(s)" excludes any Licensed SEP(s).

242. "Licensed SEP(s)-2" and "Licensed Standards-2" are concerned with video codecs and irrelevant for present purposes.

243. It is common ground between the parties that the 2021 PLA does not license "5G Only Functionality", which is defined in the contract as follows:

> **1.61 "5G Only Functionality"** includes any and all functions that implement any mandatory or optional feature of any of the 5G standard specifications but excludes any and all functions that implement any mandatory or optional feature of any of the Licensed Standards-1 or Licensed Standards-2. For clarity, if there is any function that implements any mandatory or optional feature of both (i) any 5G standard specification and (ii) the Licensed Standards-1 or Licensed Standards-2, such function shall not be 5G Only Functionality.

244. "Samsung Licensed Products" are defined in the contract as follows:

> **1.33 Samsung Licensed Product(s)"** means any and all Mobile Devices and Infrastructure Equipment that are (i) branded with a brand or trademark owned by Samsung or any of its Affiliates or (ii) co-branded with a brand or trademark owned by Samsung or any of its Affiliates and a brand or trademark owned by a wireless network operator or Unaffiliated Major Retail Distributor or (iii) branded with a brand or trademark owned by a wireless network operator or Unaffiliated Major Retail Distributor and sold directly to such wireless network operator or Unaffiliated Major Retail Distributor by Samsung or any of its Affiliates; provided that any such product (including any ODM Products) must be manufactured by or for Samsung or any Samsung Affiliate; and provided further that no 5G Only Functionality in any Samsung Licensed Product shall be licensed under this Agreement. Samsung Licensed Products do not include any Uncovered Third Party Products or Components (except, for clarity, for any Components actually incorporated in complete Mobile Devices and Infrastructure Equipment at the time of sale or other disposition to any customer of Samsung and its Affiliates). For the avoidance of doubt, Samsung Licensed Products include any ODM Products of Samsung and/or its Affiliates.

245. Given that the 2021 PLA is a cross-licence, there are equivalent provisions defining "ZTE Licensed Products" and "Samsung Licensed Patent(s)/SEP(s)". However, in the interest of brevity, and given that nothing turns on those specific definitions, I do not reproduce them here.

246. Samsung's position is that 5G products were partially licensed under the 2021 PLA because 5G SEPs that were declared essential to an earlier standard were licensed under the 2021 PLA (i.e., SEPs that were later "re-declared" essential to 5G).

247. In argument, Samsung pointed to the fact that the clauses that define licensed products (see e.g., clause 1.33 above) specifically mention that "no 5G Only Functionality" in any licensed product shall be licensed, so by implication that is what is excluded, and functionality which is 4G and 5G is not excluded. Samsung also referred to the fact that the clauses that define licensed patents (see e.g., clause 1.51 above) include "any and all … Licensed SEPs" which in turn brings one to "all Licensed SEP(s)-1" (defined in clause 1.21; see above). Clause 1.21 expressly provides that "once any Patent becomes a Licensed SEP-1, such Patent shall continue to be a Licensed SEP-1 including all patents claims therein, even if such Patent also: (i) includes at least one patent claim that is Technically Essential to 5G; or (ii) has been declared essential (or potentially essential) to 5G, regardless of the actual essentiality of such patent to 5G". Further, Samsung relied on the fact that the definition of 5G SEPs (clause 1.62) expressly provides that "'5G SEP(s)' excludes any Licensed SEP(s)-1".

248. This in the round, argued Samsung, makes plain that "re-declared" 5G SEPs are not within the definition of 5G SEPs under the 2021 PLA; thus 5G products were licensed insofar as they used "re-declared" 5G SEPs and it was only the use of 5G-only SEPs that was not covered by the 2021 PLA.

249. ZTE accepts that the effect of these provisions is that Samsung was licensed under the 2021 PLA to SEPs even where they were later "re-declared" essential to 5G. However, ZTE argues that the collective effect of clauses 1.33 (which excludes 5G Only Functionality) and 1.61 (which defines 5G Only Functionality) is that the 2021 PLA extends to "re-declared" 5G SEPs only insofar as they cover functionality in Samsung Licensed Products which is the same in the 5G standard as the 4G or earlier standards. The upshot of this on ZTE's position is that (i) totally new 5G SEPs are not covered by the 2021 PLA (on this the parties agree), and (ii) SEPs that are re-declared from 4G to 5G, where 5G uses different technology to 4G (so the patent reads differently on to the new standard) are also not covered (this is where the parties diverge).

250. In aid of its position, ZTE relied at trial on the following recital to the 2021 PLA to put the above clauses in context:

> WHEREAS, while each Party desires to grant and receive a non-exclusive, term license with respect to the Licensed Standards-1 and Licensed Standards-2, each Party also desires more time to assess the market implications of and IP landscape applicable to 5G technology, and more time to negotiate in good faith with respect to a potential future agreement between the Parties related to 5G technology, unencumbered by any statute of limitations or similar considerations, while preserving the right to pursue legal claims related to 5G technology at a future date if such negotiations prove unsuccessful;

251. In argument, ZTE said that this supports its position that the parties, at the time of entering the 2021 PLA, considered that they needed more time to assess the incremental value of 5G functionality and to negotiate towards a future agreement to cover that functionality. Samsung retorted that that recital is consistent with its position that 5G Only Functionality and 5G Only SEPs were excluded from the agreement, but that it otherwise covered re-declared 5G SEPs, given that 5G Only Functionality is the functionality that lends the incremental improvement of 5G when compared to 4G and is not covered by the 2021 PLA.

252. ZTE's construction would be considerably harder to apply in practice since it involves consideration of individual aspects of functionality and how they are done in 4G and 5G.

253. In contrast, Samsung's construction simply requires looking at declarations.

254. This relative ease of application is reflected in the evidence. Dr Chowdhury's approach to the 2021 PLA did not attempt to apply ZTE's construction but simply excluded 5G from consideration altogether and treated the 2021 PLA as though it was only a licence in respect of 4G SEPs. This, Samsung submitted, does not properly take into account re-declared SEPs and allows for some measure of double recovery on either parties' construction.

255. In contrast, Samsung's construction, I accept, simply requires looking at declarations and was applied in the evidence. Dr Lopez, applying Samsung's construction, was able to value the 5G Issue by adopting a straightforward approach of working out the numbers of re-declared SEPs and 5G Only SEPs and accounting for royalties going back in respect of 5G Only SEPs.

256. In my view Samsung's position is much more consistent with the ordinary language used and a logical overall structure. In particular, the exclusion of 5G Only Functionality in clause 1.33 and the terms of clause 1.21 ensuring patents remain licensed once declared to a standard, support its case. The greater simplicity of application points in the same direction. ZTE's position is artificial and I do not think there is any sound linguistic basis for the concept of functionality which is the same in the 4G standard as in the 5G standard. I do not see how the recital helps ZTE since there is no ambiguity to make reference to it necessary or appropriate, and as a general explanation that the parties would want to come back to 5G in due course it is neutral: returning to it would be appropriate on Samsung's approach (so as to consider the value of 5G Only Functionality) as well as on ZTE's.

257. I therefore find in favour of Samsung on this issue.

The CNS Issue

258. The CNS is reproduced below (<u>emphasis</u> added):

> **3.4 Mutual Covenants**
>
> **3.4.1** Subject to ZTE's timely receipt of the Payment (as defined in Section 4), and subject to the provisions of Section 4.1.1, ZTE, shall

> not, and shall ensure its Affiliates do not, assert any ZTE Licensed Patents against Samsung and its Affiliates, and any of their respective customers or other downstream channels, with respect to any Samsung Licensed Product that Samsung or any of its Affiliates, during the period commencing on January 1, 2024 and running through December 31, 2024 (the "CNS Period"), makes, has made, uses, imports, exports, sells, offers for sale, develop, distributes, or otherwise disposes of. No damages shall accrue as to any Samsung Licensed Products during the CNS Period. In the case that Parties renew the Agreement or otherwise make a new patent license agreement after expiration of the Agreement, Parties shall consider the value of the release covering the CNS Period.
>
> **3.4.2** Subject to ZTE's timely receipt of the Payment (as defined in Section 4), and subject to the provisions of Section 4.1.1, Samsung, shall not, and shall ensure its Affiliates do not, assert any Samsung Licensed Patents against ZTE and its Affiliates, and any of their respective customers or other downstream channels, with respect to any ZTE Licensed Product that ZTE or any of its Affiliates, during the CNS Period, makes, has made, uses, imports, exports, sells, offers for sale, develop, distributes, or otherwise disposes of. No damages shall accrue as to any ZTE Licensed Products during the CNS Period. In the case that Parties renew the Agreement or otherwise make a new patent license agreement after expiration of the Agreement, Parties shall consider the value of the release covering the CNS Period.

259. ZTE takes the position that the fact that the parties "shall consider the value of the release covering the CNS Period" illustrates that the sales of Samsung Licensed Products made during the CNS Period have not been paid for under the 2021 PLA. ZTE synonymises "consider" in that provision with "negotiate", effectively arguing that it is not a release at all but rather a deferral of payment. ZTE maintained that the willing licensee, not having paid anything for sales during the CNS Period, would agree to pay full value – or at the very least some value (see further below) – in respect of those sales on renewal. ZTE argues that if the CNS Period had been a paid-up licence, then there would have been no need to consider the value of that period.

260. Samsung's position is that the consideration paid under the 2021 PLA extended to sales during the CNS Period, which according to Samsung were as good as licensed from a commercial perspective because of the particular framing of the CNS.

261. At trial, Samsung said that there is a commercially sensible way to read the CNS as a whole (including the provision that the parties "shall consider the value of the release covering the CNS Period"): the parties had agreed that a sum equivalent to the value of licence fees for sales made during the CNS Period had already been paid under the 2021 PLA, such that when they came to consider the value of a future licence grant, the parties would consider that payment had already been made (or at least that the parties would "consider" the fact that

Samsung took that position). That, said Samsung, fits with the unambiguous provision that "[n]o damages shall accrue*"* during the CNS Period.

262. Samsung argued that the wording "[n]o damages shall accrue" is clear and plainly supports its position that no further consideration for sales made during the CNS Period are payable; that the effect of the CNS is that if no renewal licence was entered into and one or other party sued the other for damages for patent infringement, no damages would be payable during the CNS Period. Samsung argued that it would be contrary to commercial business sense for the parties to rule out the possibility of damages during the CNS Period yet, in the event they entered into a renewal licence, but only then, treat sales during the CNS Period as being unlicensed and therefore subject to further consideration.

263. Samsung also noted that the mutual standstill provision at clause 3.6 of the 2021 PLA specifically states that damages will continue to accrue during the standstill period (in contrast to the CNS at clause 3.4), which Samsung said further supports its position on the construction of the CNS.

264. Both parties also advanced fall-back positions that they argued are not deviations from an objective approach to contractual construction.

265. Samsung's primary position on the CNS Issue is that the relevant clause is not ambiguous. However, if I were to find otherwise (particularly with respect to the final sentence in that clause; see above), it made the secondary point that it is an agreed aspect of licensing practice that sometimes licensing parties include terms that are deliberately ambiguous, the reason being that it allows one or other party (or both parties) to effectively sell the agreement to their management, and that that practice of deliberate ambiguity may be part of the factual matrix. So, in other words, a reasonable person looking objectively at the contract may see there is an ambiguity that cannot be resolved and, that being the case, may recognise it as a deliberate "fudge" that allowed the parties to get the deal done. In that case, the argument proceeded, from a point of view of construction, resolution of the meaning of the deliberately ambiguous clause cannot be taken any further forward and the Court must approach it from a valuation point of view and consider what a willing licensor and willing licensee would do to resolve that ambiguity where necessary for the next round of negotiations. To put it more crudely, Samsung said that if I were to find the CNS clause ambiguous and that it was drafted so deliberately, then I must find that the parties effectively agreed to disagree and the way to move forward on this matter is to assess what would be FRAND in the circumstances, which may be neither a full release nor a complete non-release.

266. Where this fits in is the additional [REDACTED CBP] paid by Samsung for the 2021 PLA (discussed under the negotiation history above) and what this means for the CNS Issue. Samsung considered that full payment had been made to cover the CNS Period. ZTE considered that insufficient payment had been made but did not want to frustrate the deal. So, if I were against Samsung on its primary position that no further payment is required for the CNS Period, Samsung's argument would mean that in light of the deliberate ambiguity in the CNS clause, and taking account of the negotiation history, it is permissible for me as part of the valuation exercise to proceed on the basis that *some* payment was effectively

already made. Further, Samsung said that the risk of ambiguity lies more on ZTE, so any additional payment should be very low.

267. ZTE made a similar point in oral closings that if I were to find against it on its primary position on construction on the CNS Issue, the sentence, "No damages shall accrue" (see above), means that ZTE's rights in respect of the CNS Period are less valuable than they would otherwise be because of the limitation on ZTE's ability to assert them. So, said ZTE, I might take that into account by considering that the value of the release is not quite the same as the full CNS Period sales; it is reduced to a portion of the sales during that period.

268. As with the 5G Issue I think that the ordinary language supports Samsung and it is right. In particular the provision that no damages should accrue during the CNS Period is clear: as at the end of the CNS Period, ZTE could not sue for damages for products sold during it. If there was a renewal the parties would "consider" the value of the release, but that does not mean that damages would become payable after all. I agree that the last sentence is messy and somewhat unclear and neither side's approach makes perfect sense of it. I think the better view is that it just preserves both side's rights to make their case to each other in the event of a renewal. It might be said that they did not in fact need to have a contractual provision to do that, but for whatever reason they decided to. The reader of the clause might well consider that it was, accordingly, something of a face-saving fudge.

269. Given this conclusion I do not need to deal with the parties' fallback arguments, neither of which was genuinely an attempt to give meaning to contractual language but just an appeal to reach some sort of emotionally satisfying compromise. Additionally, I think Samsung's fallback was an attempt to lever in inadmissible contractual negotiations. It is in fact the case that Samsung agreed to increase the price by [REDACTED CBP] on the basis that it would get something valuable in return, in the shape of the CNS, and also that the CNS would not be valuable on ZTE's construction of it. So, Samsung's position is consistent with that particular part of the negotiation history, but that is just inadmissible and I have not relied on it in reaching my conclusion. There is also, of course, much more to the negotiations than that episode.

270. So I find for Samsung on the CNS construction issue and the overall result is that Samsung prevails on both points of interpretation of the 2021 PLA.

The VOX licences

271. I refer to the Annex to this judgment for a summary of the terms of each of the VOX licences. They are similar in many respects.

272. Neither party relies on the rates unpacked from the VOX licences to repack the CDL.

273. As mentioned above, ZTE deploys these three licences defensively to argue that this Court needs to exercise caution in relying on *any* of ZTE's licences as a basis for assessing the FRAND royalty in this case. It says that there is "No market rate for the ZTE portfolio".

274. ZTE expressed this numerically in the following table in its written submissions at trial (footnotes omitted):

[REDACTED EEO/CISZ]

275. This covers the Big Two and the VOX licences and uses different metrics [REDACTED EEO/CISZ].

276. ZTE relies on the large variation in rates unpacked from the VOX licences, including when put next to the Big Two (i) to argue that there is no established or settled market value for ZTE's portfolio, and (ii) to undermine Samsung's reliance on the 2021 PLA and ZTE-Apple 2020. As to (ii) it says that the unpacking shown above is reliable and gives much higher rates for VOX than for the Big Two, which differences, it says, are to be explained by ZTE having more equal bargaining power with the licensees in relation to the former than the latter.

277. Samsung's position is that considerable uncertainty surrounds the impact of what it calls [REDACTED EEO/CISZ] in the VOX licences. In his written evidence, Dr Lopez suggested that [REDACTED EEO/CISZ] royalty rates derived from the VOX licences *could* be brought into line with the per unit rates derived from ZTE-Apple 2020 and the 2021 PLA and with each other if unpacked on the basis of assumptions as to [REDACTED EEO/CISZ]. Dr Lopez used his analysis as a basis for demonstrating why he considered those VOX licences to be highly unreliable, depending on whether or not they are unpacked on the basis of what ZTE said [REDACTED EEO/CISZ]. The following figure from Lopez 2 demonstrated, he said, the variability in rates implied from the VOX licences and the impact of those licences being unpacked on the basis of assumptions on [REDACTED EEO/CISZ]:

[REDACTED EEO/CISZ]

278. The Big Two appear on the left (one column each), with [REDACTED EEO/CISZ] rates. Then there are three columns each, for each VOX licence, (but in the order XVO, not VOX). For each VOX licence, the rates are on the basis of the [REDACTED EEO/CISZ] position expressly stated in the agreement, a [REDACTED EEO/CISZ] and [REDACTED EEO/CISZ]. The natures of the [REDACTED EEO/CISZ], where fed in, are somewhat complex. It is not necessary for present purposes to go into the details although I say a little more below, but they relate to the [REDACTED EEO/CISZ].

279. The three columns for [REDACTED EEO/CISZ] vary widely for each licensee ([REDACTED EEO/CISZ] the most), whereas the three columns for [REDACTED EEO/CISZ] vary much less, though still appreciably, and that is because the licence contained [REDACTED EEO/CISZ].

280. In elaboration of what I have already said, following the evidence Samsung's basis for arguing that there may be [REDACTED EEO/CISZ] in the VOX licences was that (i) they were all [REDACTED EEO/CISZ]

281. There was also evidence before me on behalf of [REDACTED EEO/CISZ] (put in through a witness statement of their solicitor for an interim hearing about

confidentiality) that they disagreed with ZTE as to [REDACTED EEO/CISZ] under their respective agreements.

282. The practical overall effect, said Samsung, is that [REDACTED EEO/CISZ] and regard should be had to the implied rates if such were the case.

283. ZTE said that the VOX licences can only be legitimately unpacked according to the terms they bear on their face, and that the sort of doubts brought up by Samsung could be levelled at any licence. It also said that Samsung was effectively arguing that the agreements were all shams, a point not open to it in the absence of a pleading. To fortify that, ZTE said that Samsung had not pointed to any factual foundation for the argument in ZTE's disclosed negotiation documents for the VOX licences and nor was any such case put to Mr Tong.

284. I do not think that Samsung was saying the agreements were shams. It was relying mainly on the real world effect of the agreements if [REDACTED EEO/CISZ] and I do not see that requiring any suggestion that the agreements were not real. It would also not be a sham if the contracting parties had different views about the licence's contractual effects and/or about whether [REDACTED EEO/CISZ]. The evidence that [REDACTED EEO/CISZ] now see the effect of the agreements as different from ZTE does not surprise me and reinforces my impression that Samsung has no need to say the licences were shams, and does not do so.

285. My conclusion is that on different reasonable assumptions about the position on [REDACTED EEO/CISZ], the rates implied from the VOX licences are indeed very different, as Dr Lopez indicated. They cannot reliably be unpacked for my purposes. On one plausible view (but only one view, i.e., Dr Lopez's [REDACTED EEO/CISZ] which is the right hand column for each of the three licences) they are consistent with each other and also with the Big Two, and if that were the case they would be consistent with Samsung's overall position. On other plausible views they are very different, which would fortify what ZTE says. It is just not possible reliably to say which is to be preferred. I therefore find that they are not useful to my inquiry. They certainly do not lead me to reject the Big Two, where there is much greater transparency and ease of understanding, but they do not allow me to infer or conclude one way or another whether the Big Two were subject to non-FRAND effects, a matter which I can assess directly, though. I think it is entirely possible that the power balance in the VOX negotiations was more even than in the negotiations leading to the Big Two but I do not see that making such a comparison would be helpful, and I know a lot less about the VOX negotiations. In any event, again, I can see directly what the power balance was in the Big Two negotiations.

286. I mention finally that Dr Chowdhury's basis for rejecting the VOX licences as comparables was the fact that [REDACTED EEO/CISZ] rather than because of any uncertainties in unpacking. This does not affect my overall view of their significance.

287. My conclusion is that the VOX licences cannot reliably be unpacked, are not useful, and do not provide a reason to consider discarding the Big Two.

COMPARABILITY OF SAMSUNG LICENCES

288. ZTE argues that relying on the ENI licences as the basis for the assessment of FRAND royalties is more appropriate than relying on the ZTE licences in this case, as all the ENI licences cover 5G functionality and appear to have been negotiated by reference to the value of 5G, are all concluded with well-established net licensors[REDACTED EEO/CISZ]. It also says that the ENI licences do not suffer from the non-FRAND factors that afflict the Big Two and were arrived at between parties of equal bargaining power.

289. Samsung's position is that this Court cannot derive assistance as to what is a FRAND licence between ZTE and Samsung by looking at licences between third party counterparties and Samsung, as they are not licences of ZTE's portfolio. One of the most contentious points at trial was portfolio differences, i.e., potential differences between the composition of ZTE's portfolio and those of the counterparties to the Samsung licences, particularly the ENI licences. Samsung said this is one of the main differences to explain the delta between the CDL lump sums derived from the ENI licences and the Big Two (see the figure below from Lopez 2 which is expressed in DPUs and corrects for portfolio size):

[REDACTED EEO/CISZ]

290. I address the arguments relating to the composition of ZTE's portfolio first before moving to points specific to the ENI licences put forward by Samsung for disregarding those licences.

291. Further, Samsung's position is that if licences to non-ZTE portfolios are to be considered, then the NDDS licences and Samsung-Huawei 2022 provide a more appropriate indication of the lump sum payable under the CDL given that the respective counterparties' characteristics and/or portfolios are more similar to those of ZTE and therefore give a more reliable guide to the value of ZTE's portfolio than do the ENI licences. I come on to those licences after dealing with the ENI licences.

292. As an overview I reproduce below a summary table taken from Samsung's closing skeleton that sets out a comparison of the repacked 5G rates derived from the Samsung licences by the two valuation experts and what this means for the balancing payment under the CDL based on the experts' respective approaches when unpacking and repacking:

[REDACTED EEO/CISZ]

293. Because of the many other complexities of the unpacking/repacking, there are assumptions built into the above (e.g., Dr Chowdhury used a 50% past sales discount), but the overall pattern can be assessed.

294. One point that emerges from the above which I think is important and tended to get lost in the detail is that Dr Chowdhury's assessments of balancing payments based on ENI range from [REDACTED EEO/CISZ] to [REDACTED EEO/CISZ] (and these are for Ericsson and Nokia, not InterDigital which, as I have mentioned above largely dropped out of the picture because of being an

arbitration award). As well as being a factor of [REDACTED EEO/CISZ] apart (which applies also to the NDDS licences as a group – see below), the difference in absolute amount is over [REDACTED EEO/CISZ]. These discrepancies are so large that they severely undermine ZTE's overall case on using the ENI licences.

295. I also cannot accept ZTE's explanation that it has opted to pursue its $731m figure because it has chosen to honour having made that offer. If it was able to present a rational basis for the ENI approach it would not leave between [REDACTED EEO/CISZ] and [REDACTED EEO/CISZ] "on the table". It is essentially arguing for $731m on the basis that it is a lot less than [REDACTED EEO/CISZ] bigger numbers which cannot be justified. I do not think this is a principled way to proceed.

296. I also note the even more massive differences between Dr Chowdhury's ENI numbers on the one hand and the NDDS results on the other. The lowest NDDS balancing payment is more than [REDACTED EEO/CISZ] times smaller than the largest ENI balancing payment. Attempting to explain these differences is hard to say the least, and it is no criticism of her personally but I think Dr Chowdhury's task cannot have been helped by being given only the ENI licences when doing her first report and not the NDDS licences.

297. I think both sides took the approach, if only subconsciously, of assuming that their preferred group (NDDS or ENI) must be "right" and trying from there to explain the other group. This meant that neither engaged as much as they might with two other very important questions, which are (i) whether, from the Samsung in-licences as a whole, there is a properly comparable and adequately reliable licence or group of licences to use to work towards a FRAND rate, and (ii) whether, viewing all the information in the round, such a group of Samsung in-licences would be better than working from one or other of the Big Two. For all the reasons explored throughout this judgment, my answers are (i) no there is not, and (ii) in any case, working from ZTE-Apple 2020 is plainly much better.

Composition of ZTE's portfolio

298. The most complex issue in assessing whether it is appropriate to use the ENI licences as comparables despite being to different portfolios than ZTE's is that ZTE's portfolio is considerably more China-centric, which goes along with its having a larger proportion of families with only a single member (application or patent), and/or having been applied for only in China rather than in multiple offices around the world.

299. There is something of a high-level conceptual parallel here between the exercise of using ZTE-Apple 2020 as a comparable, as opposed to the 2021 PLA, where the portfolio is the same (ZTE's) but the putative licensee has different geographical exposure to it (Samsung being less exposed to China than Apple), and the exercise of trying to use the ENI licences as comparables rather than the Big Two, where the licensee is the same (Samsung) but the licensors' portfolios are all different and have different geographic concentrations (compared with ZTE's). In his first report, Dr Lopez allowed for each by using (differing) percentage weightings. The weighting for the latter was 80:20 US/EP:China. In

her second report, responding to Dr Lopez, Dr Chowdhury used the 80:20 portfolio adjustment (i.e., the adjustment for the latter) but not the sales distribution adjustment (i.e., the adjustment for the former).

300. I mention this because Dr Chowdhury accepted that the 80:20 weighting did not take into account any geographic portfolio strength complexities other than sheer numerical size. Nonetheless, when one gets into the details of the portfolio differences, ZTE's consistent answer is that while there may be differences other than sheer numbers when it comes to the Chinese part of its portfolio, they are swept away or minimised by the 80:20 weighting which reduces the effect of China across the board.

301. As will appear below, the question of accounting for the shape of the portfolios is complex and involves the details of patent counting. In my view, the time devoted to it and the complexity have tended to distract attention from much simpler and clearer indications of ZTE's portfolio's being very dissimilar from the ENI portfolios (in addition to the sheer numerical China-centricity):

    i) The ZTE portfolio is much newer.

    ii) As Mr Lin accepted, there would be an incentive on a party generating a new 5G portfolio to apply broadly and rapidly, and quality would be likely to suffer.

    iii) There have been state-sponsored incentives for Chinese companies to apply for patents, especially in telecoms, and this may also have led to a lower bar for making applications.

    iv) Patent applicants tend to do better in their home offices (there is nothing wrong with this and no impropriety is implied; it can result just from having good local advisers and no language barrier) with the result that applicants get more patents that are actually weak when tested.

    v) The ZTE portfolio has no battle tested patents.

    vi) The ZTE portfolio is more brittle because of having more single-member families.

    vii) The ZTE portfolio has more patents that were applied for in only one office which means that they only survived examination once.

302. Some, but only some, of these factors are correlated with the sheer numerical China-centricity.

The evidence led and burden of proof

303. Samsung argued at trial that if a party is seeking to rely on a valuation methodology which assumes that one portfolio has the same average value as another, that party must substantiate that claim with evidence. Samsung relied on [95] in *Optis CA* (reproduced above) in support of that proposition. Therefore, Samsung argued, the burden lies on ZTE to prove comparability of the portfolios in question, and it is not for Samsung to prove the lack of comparability. Samsung

argued that ZTE failed to discharge this burden and pointed to the fact that although ZTE had permission to put in equivalent evidence to that of Dr Baron, and named an expert in the field, ZTE ultimately elected not to serve any evidence on this topic. ZTE instead relied on aspects of the evidence of Mr Lin, Dr Chowdhury, and Dr Baron (in particular in cross-examination) in support of its case on portfolio quality, which Samsung contended is inadequate.

304. Samsung's position on burden of proof is that it functions as a threshold point, i.e., if ZTE has failed to discharge its burden, then the Samsung licences should not be regarded as comparables, as this Court cannot draw conclusions as to the comparison between the portfolios of those net licensors and ZTE's portfolio without evidence. Samsung said that there is an additional compounding factor that is further in favour of its position: that there has been a selection exercise by ZTE in order to identify the ENI licences out of the basket of Samsung licences which give a range of very different rates, and as I have said above it is certainly true that the ENI licences are [REDACTED EEO/CISZ] different from other Samsung licences.

305. ZTE disagreed with Samsung's position on burden of proof as a matter of principle. ZTE relied on the following passages from Arnold LJ's judgment in *InterDigital CA* (emphasis added by ZTE):

> 265. The second, and more fundamental, problem with this answer is that it assumes that the burden lay on InterDigital to prove the extent to which the rates derived from the Lenovo 7 in general, and LG 2017 in particular, had been affected by the non-FRAND factors identified by the judge. I disagree. Before explaining why, I should record that, surprisingly, neither side addressed the burden of proof in their skeleton arguments. Nor did we receive much assistance from the parties on this question when it was raised during the course of argument.
>
> 266. The starting point is that Lenovo is advancing a contractual defence to InterDigital's infringement claim by relying upon InterDigital's undertaking to ETSI to grant licences upon FRAND terms. As with any other defence, the burden is upon Lenovo to establish it. As I have explained, however, there is now no dispute that Lenovo is entitled to that defence. The dispute is as to how much Lenovo has to pay for the licence.
>
> 267. The next point is that it will be recalled that a range of terms may all be FRAND, but InterDigital is only required to licence its portfolio on the FRAND terms which are most favourable to itself (paragraph 33 above). It could be said that, in those circumstances, each side bears the burden of establishing the end of the range which it relies on.
>
> 268. **Even if that is correct in general, when it comes to the assessment of comparables, I do not consider that, save in one respect, burden of proof has a role to play. This is because the court must do the best it can with the material available.** First, the court must identify the most comparable existing licence (assuming there is one at all). Secondly, the court must make such adjustments as it considers appropriate to reflect any differences between the most comparable licence and the licence under

consideration. The court's task is to determine what a hypothetical willing licensor and willing licensee would agree. This is reinforced in the present context by the fact that the court's task is to determine what is fair and reasonable, which requires an objective assessment.

269. **Where burden of proof does have a role to play is when it comes to particular facts which a party relies upon as being relevant to the comparables analysis. Then the burden lies upon that party to establish those facts in the usual way.** In the present case, however, InterDigital relies upon the facts the judge found which I have summarised in paragraph 229 above. InterDigital has discharged its burden of proving those facts. The remaining issue is one of attempting to assess the impact of those facts on what is FRAND. This is a matter for evaluation by the court. The judge was fully entitled to reject InterDigital's case that its 5G Extended Offer, based on its "program" rates adjusted for volume and other discounts, was FRAND, just as he was entitled to reject Lenovo's case that its 14 December 2021 offer was FRAND, but that left the question of what terms were FRAND.

270. **In any event, even if (contrary to my view) the burden of proof did lie upon InterDigital, a court is not justified in resorting to the burden of proof to resolve a disputed issue unless, exceptionally, it cannot reasonably make a finding in relation to that issue despite having striven to do so: see Stephens v Cannon [2005] EWCA Civ 222, [2005] CP Rep 31**. In this case the judge did not conclude that he could not reasonably make a finding despite having striven to do so, so as to justify resorting to the burden of proof.

306. So, said ZTE, the starting point is that the burden of proof has no role to play and this Court must do the best it can with the material available. ZTE said that this is consistent with the approach of Marcus Smith J in *Optis HC* and Birss LJ in *Optis CA*. Optis had sought to contend that its portfolio was above average. Marcus Smith J considered this to be an unsustainable contention and could not undertake such an assessment of quality, as, although he was able to consider the Optis portfolio in some detail, he had no material before him to reach any particular conclusion about the portfolios of SEPs comprising the rest of the stack. Marcus Smith J thus proceeded on the basis that the Optis patent portfolio had average strength ([181]-[184] and [409] in *Optis HC*) and Birss LJ held that this was a conclusion open to the judge ([27] in *Optis CA*). As to [95] in *Optis CA*, ZTE said that what Birss LJ was saying there does not go to burden of proof, but rather the exercise to be undertaken in comparing two portfolios. ZTE also relied on the fact that the Court of Appeal ultimately found that Apple's licences with ENI and Sisvel were the better comparables to use. ZTE said that this conclusion was neither based on an assessment of the average quality of the portfolios at issue, nor was Optis or Apple considered to have the burden of showing that relying on certain licences was appropriate.

307. In any event, Samsung's main argument was that the above authorities are beside the point as Samsung has identified and evidenced, including from Dr Baron, positive reasons why it is reasonable to assume that ZTE's portfolio should be treated differently to those of the ENI licensors.

308. My conclusion from the authorities is that burden of proof is not relevant in the overall evaluative exercise of selecting between comparables, except when there is a specific fact feeding into that exercise; even if there is such a fact the Court should not resort to the burden of proof to resolve it unless, having tried, the Court cannot determine it from the evidence. In the present case, the question of whether and to what extent ZTE's portfolio is comparable to those of the ENI licensors is a question of fact, though a complex one whose answer lies on a spectrum. As to *Optis CA* I think the point Birss LJ was making was that when using comparables other than those of the patentee relative portfolio quality ought to be considered and that average quality cannot just be assumed in every case, though it was an available conclusion there. I reject any submission that he found that there is a presumption of similarity, certainly not one applicable in every case no matter what the portfolios and parties involved, but even if there were it is displaced by Samsung's evidence for reasons explained below.

309. Rarely, burden can have a place on an issue when a party bearing the burden of proof omits to call *any* evidence on it. I do think that in a high-level sense ZTE is the party that alleges that its portfolio is comparable to those of the ENI licensors, so whether it called any evidence could be part of the picture.

310. ZTE had permission to call an expert on *"quantitative comparison of portfolios (and any related statistics) in relation to ZTE's case that it is appropriate to scale and/or apportion royalties between ZTE's portfolio and the portfolios of other different licensors based on declared SEPs"* and it nominated such an expert but did not call him. It therefore had no witness to contradict Dr Baron for Samsung, and I think it is reasonable to infer that it was unable to put together an expert report to support the notion that a quantitative comparison could be made to justify scaling of the kind that ZTE said was appropriate.

311. Instead, ZTE relied on aspects of the evidence of Dr Chowdhury and of Mr Lin, and on cross-examination of Dr Lopez and Dr Baron. But though they were good witnesses on their subjects, neither Dr Chowdhury nor Mr Lin had expertise in quantitative comparison. And the cross-examination of Dr Lopez was misdirected for similar reasons: he did present numerical analysis based on what Dr Baron had done, but he was not the person to speak to portfolio comparison/patent counting.

312. Further, as to Mr Lin, he gave evidence that ZTE had been involved in standards development, as had the ENI licensors, but he accepted in cross-examination that this did not permit meaningful portfolio comparison (it was put to Dr Baron that numerical analysis of contributions to the SSOs such as ETSI can be used as a measure of portfolio quality and he agreed, although he considered it to have reliability issues but it was not for him to go and do it, it was for ZTE, if it wanted to). Dr Chowdhury accepted that she had not regarded or treated Mr Lin's evidence as going to relative portfolio quality.

313. In any case, while it would be wrong to say that ZTE had *no* evidence on the issues of portfolio comparability (so this is not one of the rare cases where burden could be decisive for that reason alone), the evidence of Dr Baron, by far the most relevantly qualified person, was unanswered by any corresponding expert witness. Although I consider some of the details below, his main conclusions

were not materially dented in cross-examination, and they are worth quoting here (emphasis added):

> 14. Evaluating patent portfolios is difficult, and patent counts can (at best) represent a rough approximation of the size and value of a portfolio. As has been demonstrated in other cases involving cellular SEP licenses, royalty rates per patent family can vary significantly from one license to the other. Thus, patent family counts have little explanatory power for the value of different SEP licenses. For this reason, comparable licenses are usually the best indicator of the value of a patent portfolio. Patent counting approaches represent a viable alternative to comparable licenses in only exceptional circumstances in which (i) no sufficiently comparable licenses are available, and (ii) the characteristics of the different portfolios are sufficiently similar so that patent counting is acceptable. This is not the case here, because there are significant differences between the portfolios of ZTE on one hand, and those of Samsung and other licensors (such as Ericsson, Nokia, and InterDigital) on the other hand.
>
> …
>
> 17. Differences in patent family size not only make it more difficult to compare essentiality rates between different portfolios, but also indicate that patents in different portfolios may have very different value. I show that patents that belong to geographically broad patent families (such as triadic or IP5 families) are substantially more valuable, as indicated by higher rates of renewals and a higher likelihood of assertion. The fact that broad families (such as triadic families) are more valuable is well-established in research and industry. Thus, it would be fundamentally unfair to count families granted in one major office only as being of similar value to families with large numbers of granted patents in many or all the major patent offices around the world. Because the geographic composition differs significantly between Samsung's and ZTE's portfolios, it would therefore be unfair and unreliable to count patent families to measure the relative size of the different companies' portfolios. Uncertainty with respect to the true essentiality rate and substantial heterogeneity with respect to the geographic composition of the portfolios jointly contribute to make patent counting (either declared patent counting or essential patent counting) unreliable in this case.
>
> 18. Because of significant differences between their portfolios, ZTE's portfolio also cannot be reliably compared to portfolios of other SEP licensors such as Ericsson, Nokia, and InterDigital. For the same reason, a royalty rate for ZTE's 5G SEPs cannot be reasonably determined by multiplying an aggregate royalty for 5G with ZTE's share in the overall number of declared 5G SEP families. This would also have the effect of assigning equal value to different companies' declared 5G SEP families, would ignore the fundamental differences between portfolios, and the substantial evidence that SEP licensing royalty rates per SEP family can differ substantially from one licensor to the other.

> 19. I conclude that patent counting approaches represent a viable alternative only in exceptional circumstances where the characteristics of the different portfolios are sufficiently similar so that patent counting is acceptable. This is not the case between the portfolios of Samsung and ZTE or of other licensors (such as Ericsson, Nokia, and InterDigital).

314. Obviously ZTE was entitled to challenge Dr Baron even without a witness of its own to contradict him and to rely on any concessions he made, and the challenge was skilfully and efficiently presented by Mr Eustace for ZTE, but my assessment is that it was unconvincing and Dr Baron's views were well-reasoned and carefully and precisely presented. It is possible to find areas of similarity between the ZTE portfolio and those of the ENI licensors; I deal with a central one relied on by ZTE below. However, those similarities are unearthed by first discarding the key differences. The portfolios remain very different overall. The fact of some similarities does not detract from Dr Baron's overall conclusions, which I accept. This makes the detailed arguments on burden essentially irrelevant.

Facts and figures on ZTE's portfolio

315. It is necessary to explain some of the terms referred to below: (i) "**INPADOC**" refers to an extended patent family, which is a collection of patent documents covering a technology, where the technical content covered by the applications is similar, but not necessarily the same. Members of an extended patent family will have at least one priority in common with at least one other member, either directly or indirectly; (ii) "**Triadic**" refers to patent families which include at least one patent application in each of the following three patent offices: EPO, Japan, and US; (iii) "**IP5**" refers to patent families with granted members in at least the following five patent offices: EPO, Japan, US, China, and Korea. The measure of IP5 families is also used to report families with either one or three out of the five offices having granted patents.

316. One can see the China-centric nature of ZTE's portfolio from the following table from Dr Baron's first report:

[REDACTED COMINF]

317. And ZTE's relatively low proportion of triadic patent families/high proportion of only-1-IP5 families from this table, also from Dr Baron's first report:

[REDACTED COMINF]

318. Then one can see visually the proportions of only-1-IP5 versus at-least-3-IP5 for various portfolios in Figure 3 from Dr Baron's first report:

[REDACTED COMINF]

319. And shares of patent applications and grants by share of patents in IP5 offices in his Figure 4:

[REDACTED COMINF]

320. One can see that ZTE's portfolio has more single-IP5 patents and fewer multiple-IP5 patents compared with the ENI licensors.

321. Dr Chowdhury prepared updated versions of Figures 3 and 4 from Dr Baron's first report, as follows (A3.3 and A3.4 respectively):

[REDACTED COMINF]

[REDACTED COMINF]

322. What has been done is to limit the analysis to families with a US or EP (in A3.3) or US (in A3.4) grant or application.

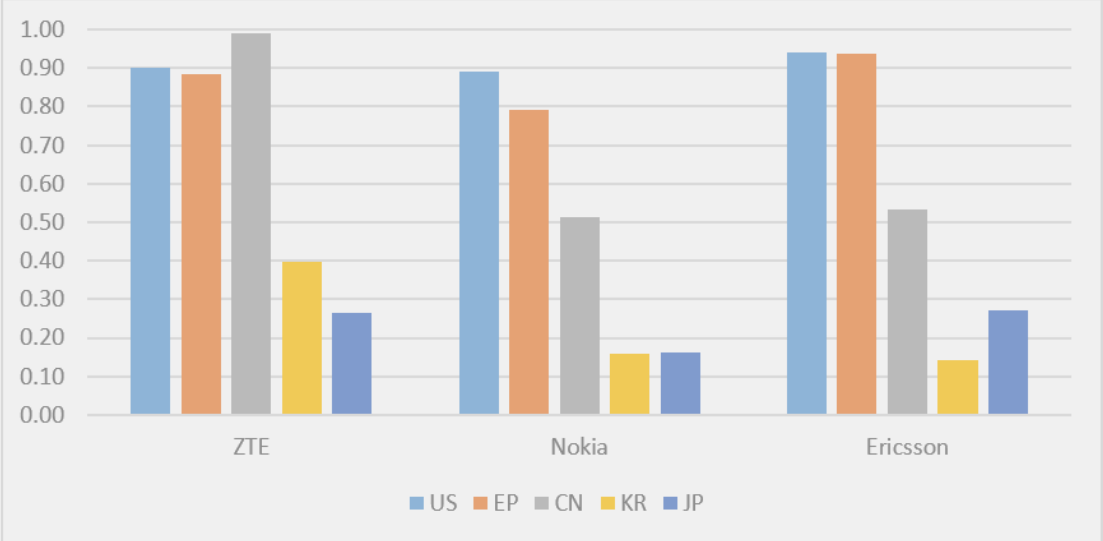
323. In this presentation, ZTE's portfolio looks much more comparable to those of the ENI licensors. If anything, it looks stronger. The reason for this is that all ZTE's China-only families have been excluded. One way of understanding this is to appreciate that for ZTE to have an only-one-IP5-applied family show up in Figure A3.4 it would have to be a family in which it only applied in the US and not in China, and it essentially never does that. Dr Baron explained his view of this as to A3.3:

> A. I just want to come back to how peculiar a way of looking at the portfolio this is because we have observed that ZTE's portfolio stands out in terms of how many of their families only have an office in China. So if ZTE has a family that only includes a granted patent somewhere in the world, that would very likely be China. More to the point, if ZTE has a family that includes an application only in China, only in one office in the world, that office would almost certainly be China. So these families are taken out here, whereas in the case of Ericsson or Nokia, if these companies have families that include applications in only one single office in the world, that office would often be either the US or EPO, so these families are included.

324. And as to A3.4:

> A. Once again if I am looking at the entire portfolio then that would be something that I would want to see as an indication of how geographically broad the portfolio is. But I have to insist a bit on that point. Like it says, we have filtered out the China-only applications, so we are seeing from that graph pretty much what I have stated; that ZTE is unique in the sense of how often it only relies on the Chinese office. So if we are showing a representation of this portfolio where we only see the portion that is filtered or conditioned on EP or US, then it is unsurprising that ZTE would have fewer families with applications in only one office. That would imply that this is a family for which ZTE used a Foreign Office as the only office of filing which, at least from my reading of the data, would have been extremely rare.

325. So Dr Baron's position was that this presentation does not give a fair impression, essentially because it produces apparent similarity by eliminating the key area of difference. I accept his evidence. He was also pressed on whether, once that difference is eliminated, what remains is similar. This part of his cross-examination was by reference to the following figure prepared for the "XX" bundle:



326. The interchange was as follows:

> Q. They show, these graphs show that when removing ZTE's China-only families, its portfolio, with the caveat you have mentioned, are very similar to Ericsson and Nokia and better in certain respects, for example in relation to the percentage of Korean patents.
>
> A. No, I do not think that it shows that and because the caveat that I mentioned is very important here, it does not establish similarity; it just shows that once we have filtered out for what I have described to be one important difference, then the portion of the portfolio that we are now looking at has similar or in some cases similar proportions of families that are applied, that include members in a certain office. So in my report I show that there are other differences between ZTE's families and other licensor's families, so it does not speak to these. I would not definitely be able to conclude that, oh, yes, they are similar and certainly not that they are better. It is, as I said, just after filtering for one thing or basically after neutralising for one difference that I have highlighted, then that difference is no longer visible from that graph. That is a bit unsurprising in that way, but other than that, it is not establishing similarity between the portfolios.

327. In written closing submissions, ZTE argued that Dr Baron had accepted that the filter to US/EP patents "neutralised" the key difference between its portfolio and those of the ENI licensors (not InterDigital in this instance). That is not a fair summary of what he said: he said that after neutralising for one difference it was still not possible to conclude that there was similarity.

328. I therefore conclude that while this exercise showed that some differences could be excluded by filtering, that does not mean that ZTE had shown relevant overall similarity.

329. ZTE's next line of argument was that Dr Lopez's 80:20 weighting substantively took care of any difference arising from China-centricity. However, Dr Lopez said in his reports that he did not consider scaling between portfolios to be reliable and in oral evidence was consistent in saying that the 80:20 allowance did not fully account for portfolio quality differences (which Dr Chowdhury also agreed with). In addition, Dr Baron was clear that characteristics of ZTE's portfolio which are unusual and not favourable, such as having relatively few families with granted members in more than one office, are not just limited to China.

Essentiality studies

330. A lot of detailed argument was also devoted to essentiality studies. I think that nearly all of it was, ultimately, irrelevant because of the very limited role that ZTE said they had.

331. ZTE accepted that in *InterDigital HC* and in *Optis HC*, reliance on essentiality studies ultimately did not succeed, and it accepted in its written closing that "this aligns with the view of Mr Lin that the studies are not reliable enough for doing a FRAND evaluation determination". Ms Maghamé also deprecated the usefulness of essentiality studies in licensing negotiations, although she accepted they were used sometimes.

332. ZTE's written closing went on to say (at paragraph 250; there was a similar statement at paragraph 254):

> 250. First, it is important to note that ZTE is not proposing to use the specific counts of families found to be essential in the studies to use as the relevant party's share of the stack, let alone the result of a single study (as proposed by the parties in the previous cases above). ZTE's case is a far less ambitious use of the studies: it is merely to use the essentiality studies as a whole as a directional indicator of the likely essentiality of ZTE's portfolio compared to that of Ericsson and Nokia to see if there is a substantial difference between them that would make scaling unreasonable on that basis.

333. Samsung said the following in its written closings (footnotes omitted):

> 80. ZTE's licensing and valuation experts considered essentiality studies to be unreliable as a way of evaluating FRAND. It is common ground that essentiality studies, which seek to provide estimates of the proportion of patents that are in fact essential to the standard to which they have been declared, are unreliable. …
>
> 81. Nevertheless, ZTE sought during the cross-examination of both Dr Baron and Dr Lopez to develop a case that, based on a certain sub-set of essentiality data, conclusions could be drawn about the similarity of ZTE's portfolio to those of Nokia and Ericsson. This case was not foreshadowed

> in ZTE's own expert evidence nor was it set out in its opening. Nor was it fairly and squarely put to Dr Baron. Instead ZTE sought to put aspects of this case to Dr Baron and other aspects to Dr Lopez. Given Dr Lopez did not profess to have any expertise in essentiality studies or statistical methods relating to them, this was inappropriate. This was an attempt to try to plug the very significant gap in ZTE's case relating to the lack of evidence of any substantive similarity between ZTE's portfolio and those of Nokia and Ericsson (to the contrary, the evidence that there is, is that ZTE's portfolio is not similar to those of EN (or I)). Nevertheless, since ZTE may seek to place reliance upon it in their closing, it is dealt with briefly here.
>
> 82. The starting point is Dr Baron's report which gives evidence about essentiality studies and the difficulties of drawing any conclusions from them given the different results that different providers produce. This is an area where Dr Baron's conclusions were entirely consistent with licensing practice: both Ms Maghamé and Mr Lin gave evidence that essentiality studies were not useful.

334. The parties seemed in agreement, or at least ZTE accepted (and anyway I would find), that essentiality studies are "prone to cherry picking", are only useful where there is agreement across reports from the same source, and between sources (which there often is not), and need to have wide confidence intervals (± 12% was one illustrative figure given).

335. This means that while it is possible to find aspects of essentiality reports which tend superficially to show that the ZTE portfolio is similar to ENI, and others which show that it is different, none can be relied on. It is just cherry-picking. ZTE cannot show similarity via essentiality studies, and did not try (see above), but nor can Samsung make the point that ZTE lacks evidence of similarity from essentiality studies that it could have obtained had it tried harder: Dr Baron's evidence was precisely to the effect that they cannot be used that way.

336. Given all this, I do not need to go into the detail. I will just say that I reject any insinuation that Dr Baron was in any way misleading in relation to the PA Consulting data, as appeared at one stage to be suggested. I will also say that it was misconceived to try to get Dr Lopez to disagree with Dr Baron on this topic. I do not think there was any material disagreement and anyway Dr Baron was the relevant expert to ask, not Dr Lopez.

337. Finally, the way that parties in real negotiations assess essentiality (and, where they want to, validity) is by detailed scrutiny of claim charts against the standard. This cannot be done in the context of a FRAND trial such as the present for practical reasons.

The ENI licences – other matters going to comparability

338. Details of these licences appear in the Annex to this judgment.

Litigation risk

339. In my view, my conclusions as to the material dissimilarities between the ZTE portfolio and the portfolios of the ENI licensors would be enough in themselves to reject the use of the ENI licences as comparables. But there are other factors as well, which are relevant both to comparability and to trying to understand the very large difference between the ENI rates and the rates for the NHDDS licences.

340. First, the ENI licensors are the most active and organised licensors who regularly seek, obtain, and enforce injunctions. At the time of Samsung-Ericsson 2021, Ericsson was seeking an exclusion order in the US ITC [REDACTED EEO/CISZ] (Mr Chang also said there was an imminent risk of an injunction in the Netherlands but he was not directly involved and details are lacking). It does not appear that any litigation with Nokia was actually on foot at the time of the 2023 agreement with Samsung, but that does not mean that Samsung would not have been in fear of it happening quite quickly: the licensing and fact evidence was that the perception in the industry was that the time to an injunction in Germany might only be a year.

341. The thrust of ZTE's argument on this was that a sophisticated and well-resourced implementer would not be pressured into immediately paying supra-FRAND rates in the face of potential litigation or actual litigation.

342. ZTE argued that the starting point is that, until being sued, the outside option for implementers is to simply carry on selling their products, carrying on their businesses until they are actually injuncted. ZTE said that implementers know that negotiations can run on for years without litigation being brought because patentees will be very reluctant to litigate due to (i) worldwide litigation campaigns being expensive, (ii) reputational damage to their portfolios, (iii) a risk that the rates for their portfolio are publicly declared to be low (e.g., from FRAND determinations), (iv) Ms Maghamé's evidence that litigation can lead to delay in receiving licensing revenue, and (v) Mr Lin's evidence that other licensees can refuse to agree licenses while litigation is ongoing, further delaying those negotiations. Further, ZTE contended that implementers would also know that licensors such as Nokia and Ericsson normally offer arbitration before they would consider litigation. ZTE also made the argument that while the movement relatively recently may have been towards patentees focussing on bringing patent infringement actions, even a few years ago the focus for patentees was on rate determination actions (e.g., *Nokia v. Oppo*).

343. ZTE contended that even if litigation were started an implementer would not be pressured into immediately paying supra-FRAND rates. ZTE's bases for this contention were that (i) against major infrastructure manufacturers like Nokia and Ericsson, an implementer could put their own injunction risk on the table, Samsung having experience with this strategy, (ii) implementers could rely on the FRAND defence or other strategies (e.g., anti-suit injunctions) to avoid injunctions, (iii) as Mr Chang accepted, from the commencement of proceedings, it takes around a year to obtain an injunction which would be considered very quick, and (iv) Mr Lin's evidence that in his experience sophisticated implementers will just carry on their normal business activity even in the face of potential litigation or actual litigation.

344. ZTE also relied on the following passage from *UPHC*:

> 420. Standing back, this licence represents a solid piece of evidence of what reasonable people in the industry would do. The two parties have broadly equivalent economic strength. It has been freely negotiated rather than set by an arbitrator. There was litigation between Ericsson and Samsung before it was agreed but I doubt parties of the size and sophistication of these two were troubled by that. This licence is solid evidence from which one can infer what a fair and reasonable value of the portfolio under licence might be. All the same that inference is not as simple as a statement that the implied 4G rate for Ericsson's portfolio is in the range of *[...]*. The parties also negotiated and agreed *[...]*.

345. These are all factors that I accept are relevant to some extent, but I know that Ericsson had actually brought litigation against Samsung when that ENI licence was settled, and although the litigation landscape has fluctuated over time the licensing evidence as well as general experience of FRAND litigation leads me to conclude that at the time the Samsung licence from Nokia was concluded it was seen as possible for a patentee to get an injunction really quite swiftly in major markets, with the possibility of very large sales losses, albeit at some cost and risk to the patentee (although I think ZTE overstated that as, for example, I find it unconvincing that there is a major reputational risk to a patentee in losing a SEP to an invalidity attack: all those involved know that some SEPs are valid and some are invalid, even in the strongest portfolio). I acknowledge the lack of direct evidence on Samsung's situation with Nokia and that the threat would have been less immediate than that from Ericsson, but it is not realistic to think that Samsung would not have perceived a really major litigation risk from Nokia in the absence of a settlement. As well as from Ericsson.

346. In relation to the point about *UPHC*, that concerned an earlier time and a different licence, and Birss J certainly had different evidence. I also do not think that he had before him the sort of picture of the differences between NDDS and ENI, which lead me to think that litigation threat is likely to be an explanation. I do not overlook that there was litigation involved in two of the NDDS licences, but the threat posed by litigation, on the licensing evidence, can be very different depending on the resources and appetite of the patentee and the exposure of the potential licensee.

347. Overall, it seems highly likely that the rates achieved by the ENI licensors were very materially increased by the threat of litigation and injunctions. ZTE objected to Samsung even taking this point, on the basis of the burden of proof/lack of disclosure, and the absence of any pleaded case that the ENI licences were at supra-FRAND rates. I reject the pleading point. Samsung's pleading raised a general case that the ENI licences were not useful comparables and litigation risk was one of the matters raised in support of that. The fact that it was not expressed by reference to supra-FRAND rates is not a point of substance. Anyway, the point was flagged well in advance of trial through the evidence and the willingness and ability for litigation of these companies is universally known (this is not a criticism of them). It is fair to say that Samsung's decision not to give detailed evidence of the negotiations of all its in-licences means that I do not have much detail about the specific injunction risk assessment/discussion in any

individual case, and I take that into account. But its decision to proceed primarily on the basis of an objective approach was reasonable, and I have no positive reason to think it was concealing anything. It is also material that Mellor J rejected disclosure on this sort of issue twice, for reasons largely of proportionality and utility, as I have narrated at the start of this judgment. That leads on to a discrete point ZTE made, which was that adverse inferences ought to be drawn against Samsung on the question of whether the ENI licences were concluded under the effect of non-FRAND factors such as litigation threat.

Adverse inferences

348. ZTE relied on authorities such as *Royal Mail v. Efobi* [2021] UKSC 33 and *Wetton v. Ahmed* [2011] EWCA Civ 610. I reproduce below the passages from those authorities that I was directed to in ZTE's opening written submissions:

349. *Royal Mail v. Efobi*:

> 41. The question whether an adverse inference may be drawn from the absence of a witness is sometimes treated as a matter governed by legal criteria, for which the decision of the Court of Appeal in *Wisniewski v Central Manchester Health Authority* [1998] PIQR P324 is often cited as authority. Without intending to disparage the sensible statements made in that case, I think there is a risk of making overly legal and technical what really is or ought to be just a matter of ordinary rationality. So far as possible, tribunals should be free to draw, or to decline to draw, inferences from the facts of the case before them using their common sense without the need to consult law books when doing so. Whether any positive significance should be attached to the fact that a person has not given evidence depends entirely on the context and particular circumstances. Relevant considerations will naturally include such matters as whether the witness was available to give evidence, what relevant evidence it is reasonable to expect that the witness would have been able to give, what other relevant evidence there was bearing on the point(s) on which the witness could potentially have given relevant evidence, and the significance of those points in the context of the case as a whole. All these matters are inter-related and how these and any other relevant considerations should be assessed cannot be encapsulated in a set of legal rules.

350. *Wetton v. Ahmed*

> 14. In my judgment, contemporaneous written documentation is of the very greatest importance in assessing credibility. Moreover, it can be significant not only where it is present and the oral evidence can then be checked against it. It can also be significant if written documentation is absent. For instance, if the judge is satisfied that certain contemporaneous documentation is likely to have existed were the oral evidence correct, and that the party adducing oral evidence is responsible for its non-production, then the documentation may be conspicuous by its absence and the judge may be able to draw inferences from its absence.

351. ZTE argued that if a litigant wants to say that one of its own licences, that only it and not the other side is party to, was affected by a particular non-FRAND factor, the Court, when assessing the evidence, should consider whether disclosure has been provided on that point and, if not, whether there is any doubt about what that disclosure would have shown. That, argued ZTE, would prevent a party from being able to improve its position by basing its case on an insinuation that a factor is capable of being relevant to a licence without actually having to prove it.

352. Samsung's position on this was that neither of the above two cases cited by ZTE is on point and that there is no basis for drawing adverse inferences here. My attention was drawn in Samsung's written submissions to certain procedural requirements for inviting the Court to make such inference as set out in *Ahuja Investments v. Victorygame* [2021] EWHC 2382 (Ch) at [25]. Samsung said that ZTE has not satisfied the procedural requirements for inviting the Court to draw such an inference as it has not, either in the lead-up to trial or in its written or oral opening, identified the point on which the inference is sought or the inference to be drawn, the reasons why it is said that the missing documents/witnesses would have been material, explained why ZTE could not have been expected to call/summons the relevant witness or make a request for what is said to be the relevant disclosure, or explained why the inference sought to be drawn is justified on the basis of other evidence before the Court.

353. In my view ZTE's argument was over-engineered and unrealistic. Samsung has been transparent that it intended to take an objective approach to its comparables, and that approach is supported by the case law and (effectively) accepted by Mellor J on the disclosure applications. The fact that ZTE devoted a lot more attention to detailed events in the negotiation of the Big Two was its choice, and has paid off in persuading me about the non-FRAND factors at work, but does not mean that Samsung should be punished for taking a different approach. I doubt in any event if there would be documents in the categories sought by ZTE which really spelled out the degree to which Samsung feared litigation from Ericsson, Nokia, or InterDigital. It obviously did to a material extent which probably varied over time.

354. That being so, the procedural requirements as to flagging up an invitation to draw adverse inferences do not matter, but I agree that ZTE did not satisfy all of them. Some of them do not really arise, since ZTE did try to get the disclosure it said was relevant but failed, a point in Samsung's favour.

Other patents

355. The ENI licensors all licence [REDACTED EEO/CISZ] directly rather than through a pool and it is hard to know what effective rates they achieve for that part of their portfolios.

356. More generally, the ENI licensors have many patents other than cellular SEPs (they have non-cellular SEPs and NEPs) [REDACTED EEO/CISZ] and valuing them is not something I can really do. Dr Chowdhury tested 12.5% as a sensitivity for [REDACTED EEO/CISZ] but that did not cover other patents.

357. The points about [REDACTED EEO/CISZ] and other patents have some force but are much less significant than the injunction risk. They form part of the picture but I think I could have dealt with them by some appropriate adjustment if the ENI licences were otherwise sound comparables. They would not have been enough for outright rejection on their own.

Samsung-InterDigital 2025 specific factor

358. Samsung argued that since Samsung-InterDigital 2025 was settled in arbitration, it is not evidence of what willing reasonable business people would agree in a negotiation and accordingly not probative of the market value of the portfolio under licence. Samsung argued that even as mere persuasive authority an arbitrated licence without the arbitral award is not much use and arbitral awards are inadmissible as evidence of FRAND terms. Samsung cited several cases in support of this proposition but largely relied on what was said by Birss J in *UPHC* at [171], [411], and [412] and Hoffmann J in *Land Securities v. Westminster City Council* [1993] 4 All ER 124.

359. I did not understand ZTE to disagree with the above point as a matter of principle. Although there was some suggestion by it during openings that commercial parties in the industry might have been able to form an idea of what the rate in the licence was been based on public information, I put to ZTE's counsel during closings whether ZTE was still relying on the InterDigital licence in the ENI licence category given the arbitration point. ZTE's counsel accepted that it is not in the same category. That being so, I have paid much less attention to it, but as already mentioned, even if included it would raise essentially the same issues as the Ericsson and Nokia licences.

NDDS licences

360. Again, details of these licences appear in the Annex to this judgment.

361. As noted in the introduction to this judgment, in response to ZTE's reliance on the ENI licences, Samsung pleaded reliance on the NDDS licences and Samsung-Huawei 2022, which imply very different rates to the ENI licences.

362. Samsung contended that the counterparties to the NDDS licences are more similarly situated to ZTE than the ENI licensors in that their portfolios have centres of gravity outside of the US or Europe (i.e., in China in the case of Datang, and Japan in the case of NEC, Docomo, and Sharp) and have had a shorter period of involvement in the standardisation process (Datang). These are valid points and I take them into account.

363. Samsung also noted that Huawei, like ZTE, has its centre of gravity in China and only started its involvement in standardisation in later generations (I discuss Samsung-Huawei 2022 in the next section of this judgment).

364. In closings, when deploying the NDDS licences, Samsung focused rather more on Samsung-Datang 2024 and Samsung-Sharp 2024. The reason for this is that Samsung said that there are particular features in those two licences that show that they were the result of tough negotiations. Samsung drew particular focus to

the fact that (i) Samsung-Datang 2024 was entered into following [REDACTED EEO/CISZ]litigation between Samsung and Datang, during which Datang obtained an injunction against Samsung in Germany, and (ii) Samsung-Sharp 2024 was also entered into following [REDACTED EEO/CISZ] litigation, including patent infringement actions brought in the District Court of Munich. So, said Samsung, viewed objectively, there is no basis to say that the royalty rates agreed under the NDDS licences were sub-FRAND, and as far as the Datang licence is concerned, Samsung said if anything it is likely to have been agreed at the higher end of the range, if not supra-FRAND. Samsung thus argued that if the NDDS licences are taken into consideration, they are consistent with Samsung's case as to what constitutes a FRAND rate for the CDL.

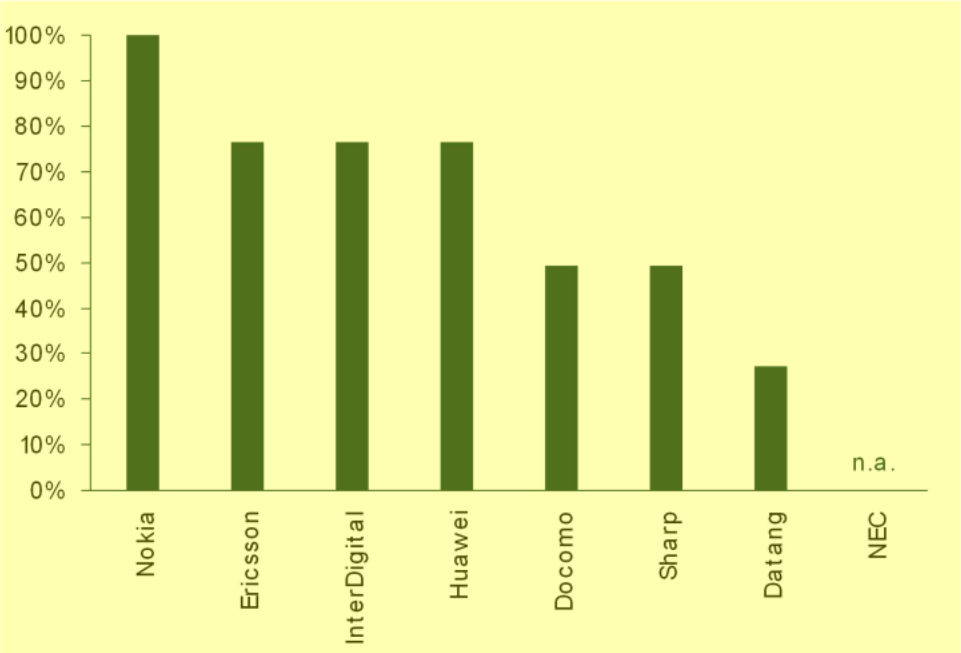
365. ZTE however argued that the differences in rates unpacked from the NDDS licences and the ENI licences are due to the lack of bargaining position on the parts of NDDS, rather than differences in portfolios.

366. ZTE met on the facts the contention that the differences in rates between the ENI licences and NDDS licences can be explained by differences in portfolios. For example, it said that the NDDS licensors also [REDACTED EEO/CISZ], and said that each of NEC, Docomo, and Sharp are higher than Ericsson and Nokia in every essentiality study, and each of the NDDS licensors has [REDACTED COMINF] than Ericsson and Nokia. Rather as with the ZTE/ENI comparisons, there is some evidence of similarity in some respects, but I cannot reach any firm conclusion. It is a real possibility that the portfolios of the two groups differ, and one concrete piece of evidence I have, which overlaps with litigation risk, is that the ENI licensors were the best placed in the industry when it came to litigation grade patents.

367. In any event, ZTE went on to say that if the differences in rates between NDDS and Ericsson and Nokia licences are not driven by the value of the portfolios then they must be driven by bargaining position, with Samsung being much stronger than all the NDDS licensors but meeting its match in Ericsson and Nokia. ZTE pointed to evidence where Dr Lopez accepted that the broader litigation histories of the NDDS licensors are substantially less expansive compared to those of the ENI licensors and relied on the evidence of Mr Lin where he noted that (i) NEC has not historically shown a willingness to litigate its cellular portfolio, (ii) Docomo is not very active in enforcing its SEPs through litigation, has not brought litigation in the last decade, and is a very new entrant in relation to out-licensing, and (iii) while Sharp has brought litigation, its litigation campaigns are not on the same scale as those brought by Nokia and Ericsson.

368. ZTE further argued that NDDS are not experienced licensors. ZTE firstly pointed to the following figure from Chowdhury 2 to say that NDDS have not licensed a large percentage of the market (although Dr Chowdhury accepted in cross-examination that as she has based this on publicly available information there could be licences between any of these SEP owners and an implementer which has a confidentiality provision and thus would not be reflected in this graph):

Figure 2.4 **Licensing of top six handset manufacturers (excluding Samsung) by ENI and NHDDS**



Note: The top six manufacturers by global market share in 2024 are Apple (16.2%), Samsung (15.5%, excluded from the above analysis), Transsion (14.0%), Xiaomi (11.7%), Oppo (10.7%) and Vivo (7.0%). realme sales are incorporated with Oppo's as aligned with Dr Lopez, see Lopez 1, Table 1. Market shares are calculated based on volumes reported by IDC. I have relied on publicly available information and input provided by Powell Gilbert to identify which manufacturers have been licensed by ENI and NHDDS.

Source: **Exhibit AC-74:** Handsets and Smartphones market shares.

369. ZTE also relied on Mr Lin's evidence where he noted that (i) NEC was not on his radar as a licensor when he was at Xiaomi from 2016 to 2022 and that it seems that Samsung may be the only major licensee that NEC has signed up as a net licensor, (ii) Sharp's first outbound license was with Samsung in 2019 and in his personal experience of negotiating with their team, they were not very experienced compared to Nokia or Ericsson, and (iii) Docomo's position as Japan's largest mobile network operator has a significant impact on its dynamics with handset manufacturers (i.e., the key part of Docomo's business is its carrier revenues, so would be reluctant to jeopardise its relationship with handset manufacturers through aggressively monetising its portfolio). ZTE also relied on Dr Chowdhury's evidence where she noted certain press releases detailing a broader business relationship between NEC and Samsung (dating back to 2018) and Docomo and Samsung (dating back to 2021), which ZTE contended would have impacted on the respective SEP licence negotiations and undermined the comparability of those licences.

370. ZTE also pointed to a witness statement of Mr Weichen Peng, Senior Licensing Counsel for Datang, which was filed in these proceedings in support of Datang's objections to certain aspects of Samsung-Datang 2024 being redesignated in these proceedings as non-confidential. [REDACTED EEO/CISZ].

371. Overall, I conclude that the NDDS licensors were significantly less experienced and resourced than the ENI licensors in relation to licensing and in relation to

litigation. They would be regarded as presenting a materially lower litigation risk.

NDDS rate variation

372. Another point about the NDDS licences is that the rates/sums they imply once adjusted for portfolio size are all much smaller than for ENI, but still materially different from each other, by factors of up to about [REDACTED EEO/CISZ] (leaving aside Huawei-Samsung 2022 which is [REDACTED EEO/CISZ] but to which other factors apply). The pattern of differences cannot be accounted for entirely by litigation risk. Of course I have few data points and I must bear that in mind. My slightly tentative assessment is that rates achieved are not dependent only on objective factors such as portfolio strength but are also heavily affected by matters such as the general importance of licensing to the licensor's core business, and especially by the lack of transparency in negotiations which leads to inconsistent outcomes.

NDDS versus ENI – overall assessment

373. My overall view is that the very large differences between unpacked rates from the NDDS licences and from the ENI licences are attributable to actual or perceived differences in portfolio strength and by differences in bargaining power, but it is impossible to assess the individual effects of these factors.

374. The extremely strong bargaining positions of the ENI licensors are attributable to a variety of factors, some of which are FRAND and some of which are not. For example, it cannot be non-FRAND for those licensors simply to have licensing experience and financial resources which match Samsung's. On the other hand, it may well be non-FRAND to leverage injunction risk highly, and my finding above is that that is likely to have been significantly engaged (I repeat that this is not a finding of unlawful or inappropriate behaviour by the licensors).

375. For parallel reasons, I think the NDDS rates are to some extent comparatively depressed by those licensors having less bargaining power, experience, and resources than Samsung, and either no appetite for litigation or less willingness to follow it through on the same scale as the ENI licensors.

376. I conclude that it is impossible to work out where the "right" answer is between the NDDS licences at the lower end and the ENI licences at the higher end. By "right" I mean factoring out all non-FRAND effects with the hope of some convergence to a value or "corridor" in the middle. I doubt if the exercise would ever be possible but it certainly is not possible on the evidence I have. It is, in particular, not possible to work out if ZTE's $731m position is in the "right" corridor from the Samsung licences.

Samsung-Huawei 2022

377. Samsung-Huawei 2022 occupies a particular place in the case, and a lot of time was spent on it, but in the end I have not found it of any help. In short, its assessment has all the issues of the other NDDS comparables in the case *plus* three of its particular provisions are disputed as to their meaning, and/or are

difficult to understand commercially, and depending on some messy factual issues make a major difference to the resulting lump sums proposed.

378. There are two reasons Samsung-Huawei 2022 occupied so much time. The first is the result of all the complications I have just mentioned. The second is that it does on some views give lump sum results which are higher than one gets from the Big Two and the NDDS licences on one hand, and lower than the ENI licences on the other. So, it appeared to be a candidate for finding a middle ground between the parties' widely differing primary positions or "jackpot" cases. I detected this possibility (rather faintly) in the parties' opening written submissions and asked them to consider it for the purposes of their closings.

379. In their closings, each side then put forward "middle ground" cases for this licence functioning as an alternative starting point should I reject their respective primary cases. But neither showed any real enthusiasm for the exercise, with Samsung saying the result was at most [REDACTED EEO/CISZ] than its case on the Big Two, and ZTE saying the result was only [REDACTED EEO/CISZ] than its $731m offer (though it also said that the amount Huawei achieved was severely depressed by sanctions and that had it not been for that, the result would have been fully in line with the ENI licences).

380. It was worth asking the parties to consider whether Samsung-Huawei 2022 could provide a middle ground, as the FRAND authorities indicate the problems when the parties stick only to their jackpot arguments, but since neither side really ventured into the middle ground in substance via this potential comparable, the exercise has not borne fruit. I must still explain why I do not find the licence useful but essentially what follows is a digression into a lot of licence-specific factual analysis as an alternative support for rejecting Samsung-Huawei 2022 on the simple basis that neither party really relied on it, and the reader of this judgment interested in the overall nature of my reasoning may prefer to pass on to the next main section where I turn to deal with the general points on unpacking and repacking. In addition, much of my analysis depends on confidential matters.

381. While Samsung's position is that Samsung-Huawei 2022 should be considered in the context of the other NDDS licences (and in particular those with Datang and Sharp), Samsung's pleaded position was that Samsung-Huawei 2022 at least had the positive factors that Huawei is based in China, has historically had more of a regional focus, has a portfolio with similar characteristics to the ZTE portfolio, and has had a similar period of involvement in the standardisation process. [REDACTED EEO/CISZ] Samsung said that ZTE's portfolio was less valuable than Huawei's.

382. These are all factors which suggest that Samsung-Huawei 2022 might be useful, but they do not begin to address the issues with trying to unpack it.

383. ZTE said that in scaling between Huawei's and ZTE's portfolio account should be taken of the fact that its portfolio is likely of higher quality to that of Huawei. In support of its position, ZTE pointed to its [REDACTED EEO/CISZ]. ZTE also pointed to a footnote in Baron 1 where Dr Baron noted that Huawei was below the average essentiality rate across the various essentiality studies. Thus, ZTE said that it is likely that its portfolio is of higher quality to that of Huawei.

384. As to portfolio strength, to scale from Huawei to ZTE for future 5G sales Dr Lopez adopted an assumed portfolio strength ratio of [REDACTED COMINF] for Developed Markets and [REDACTED COMINF] for China. Samsung said that these ratios are reasonable and likely an overstatement of the relative value of ZTE's portfolio given those seen in Baron 1, Table 4 (reproduced above), where comparing ZTE and Huawei's triadic and IP5 patents would give adjustment factors for the 5G portfolios for Huawei to ZTE of [REDACTED COMINF] based on triadic, [REDACTED COMINF] based on IP5, and [REDACTED COMINF] based on IP5 (at least 3).

385. In my view this issue of portfolio strength, while complex, might have required an adjustment but in itself would not have been a reason to discount the licence as a comparable. I doubt however if there would have been a major adjustment in ZTE's favour.

386. As already mentioned, ZTE also made a point on the effect of sanctions on Huawei. Huawei was first placed on the US export blacklist in 2019. Subsequently in May 2020, the sanctions on Huawei were expanded so as to limit Huawei's access to global chip manufacturers. ZTE relied on evidence from Dr Chowdhury to say that these restrictions significantly affected Huawei's business, with its handset sales in Europe, for example, and also its Chinese handset sales collapsing. On sanctions, ZTE also relied on the evidence of Mr Lin where he explained the "devastating" impact the sanctions had on Huawei's businesses and noted the resulting "major shift" in their IP and monetisation strategy. Dr Chowdhury explained that the impact of the sanctions "is directionally relevant even if Huawei had enough cash reserves and short-term investments at the end of 2021".

387. Samsung argued that it was mere speculation by Dr Chowdhury that the sanctions may have impacted Huawei's bargaining power. Moreover, Samsung said that she was non-committal as to the extent to which Huawei's bargaining power was in fact reduced. Further, Samsung pointed to the evidence of Dr Lopez where he noted that at the time of the agreement, Huawei was sitting on a substantial cash pile of c.$65bn. Mr Chang's evidence was that Samsung was aware of the sanctions against Huawei but that it was actually a point that Huawei used to its advantage to obtain more money from Samsung in licensing fees, and Samsung's opinion was that Huawei's fortunes would rebound. Samsung also took me to contemporaneous reports that suggest that by the time of Samsung-Huawei 2022, Huawei's fortunes were on the rise again. Thus, Samsung said that there is no basis for making any assumption about the effects of sanctions on Huawei's bargaining power at the time of Samsung-Huawei 2022.

388. If I were otherwise attracted to this licence I might in principle have considered making an adjustment for the effect of sanctions, but unlike with ZTE I do not have direct evidence of the effect of them on the business and I cannot just assume that Huawei was affected in the same way or to the same degree as ZTE, in my view. For example, I know that they were both bouncing back to some extent when they licensed Samsung, but I do not know relatively speaking how much and I do not know if Huawei had the same internal cash crunch. That would be a more major problem and would have prevented me making a meaningful adjustment in which I could have had confidence. I think ZTE's argument that

the effect of sanctions was such that, had they not been in force, Huawei would have achieved a result comparable to those of Ericsson and Nokia, is implausible.

389. Where the difficulties really kick in, though, is in trying to unpack the licence. There are three difficulties with it, the first of which is self-contained, and the second and third of which revolve around the fact that many Samsung devices had used [REDACTED EEO/CISZ]:

    i) First, [REDACTED EEO/CISZ]. Following the evidence, ZTE gave up on this point and accepted Dr Lopez's valuation. But the difference between him and Dr Chowdhury was nearly [REDACTED EEO/CISZ], so this was a huge uncertainty.

    ii) Second, [REDACTED EEO/CISZ].

    iii) Third, [REDACTED EEO/CISZ].

390. [REDACTED EEO/CISZ].

391. ZTE relied on Dr Chowdhury repacking an implied lump sum of c. [REDACTED EEO/CISZ] for the CDL from Samsung-Huawei 2022 whereas she repacks an implied lump sum c. [REDACTED EEO/CISZ] higher based on ZTE's primary case (i.e., the ENI licences). It said these differences are accounted for by portfolio strength and (as already mentioned) the effect of sanctions, but said that the Samsung-Huawei 2022 unpacked amount is [REDACTED EEO/CISZ] its offer of $731m, as I have outlined above.

392. Dr Chowdhury's c. [REDACTED EEO/CISZ] assumes, however, that ZTE is correct on the CNS and 5G issues on the meaning of the 2021 PLA, and on all the unpacking issues on Samsung-Huawei 2022.

393. Dr Lopez provided a range of possibilities, reflected in the table below. The table depicts the cumulative effect of repacking the CDL using Samsung-Huawei 2022 based on various assumptions made as to the unpacking issues and the points on the 2021 PLA:

[REDACTED EEO/CISZ]

394. [REDACTED EEO/CISZ] In any case, they both represent Dr Lopez's DPU approach. The next row is based on an *ad valorem* approach (which actually comes in somewhat lower). The fourth and fifth rows show how much the lump sums would go up if Samsung was wrong on, respectively, the 5G Issue and the CNS Issue under the 2021 PLA (i.e., the first two rows assume that Samsung is right about them).

395. The first column "Lopez 1 Assumptions" reflects his DPU-based approach on certain central assumptions which I do not need to describe for present purposes. The next three columns illustrate the effect of adding the [REDACTED EEO/CISZ] (assuming Dr Lopez was right about the value, as ZTE conceded, so this has no remaining effect), then the [REDACTED EEO/CISZ]. The last column is the arithmetical average of the two preceding columns so in a rough

sense reflects the possible expected value of the licence under uncertainty about whether or not the two previous columns would apply.

396. The upshot, Samsung said, is that the repacked implied lump sum from Samsung-Huawei 2022 for the CDL based on Dr Lopez's analysis (c. [REDACTED EEO/CISZ]), should not affect the overall result by more than about [REDACTED EEO/CISZ].

397. The very large uncertainties arising from the two unpacking issues that depend on the [REDACTED EEO/CISZ] situation are plain to see. One question I had was whether I should look at the matter probabilistically, i.e., valuing the chance of the respective threshold events occurring, or whether I should reach binary, yes/no decisions about them. During closings the parties agreed that I can approach the matter probabilistically. I think this is right in principle, since what I should look to is the value of the deal to the parties when it was concluded, and a binary approach would imply a certainty that neither of them could have. The difficulty is that I have no sound way to assign probabilities, but I think I can say that it is very unlikely that either Samsung or ZTE would be much more likely to win on both. The best guess is somewhere in the middle.

398. The highest possible number from Dr Lopez's table is [REDACTED EEO/CISZ]. This is not so very far from Dr Chowdhury's [REDACTED EEO/CISZ] once one takes out of account her now-accepted overvaluation of the [REDACTED EEO/CISZ]. But both assume that ZTE is right about both interpretation points on the 2021 PLA and both unpacking points specific to Samsung-Huawei 2022. I have held that ZTE is wrong about the 2021 PLA in both respects, and that it is unlikely to be right about both Samsung-Huawei 2022 points. So, I think that both Dr Lopez's highest value and Dr Chowdhury's assessment are a lot too high. Whatever number emerges [REDACTED EEO/CISZ] the value I reach from ZTE-Apple 2020, but that has little significance if any given that the assessment of Samsung-Huawei 2022 is so riven with uncertainty.

399. I turn then to the specific unpacking issues that arise in the context of Samsung-Huawei 2022.

Unpacking issues specific to Samsung-Huawei 2022

400. As mentioned above, there are two specific issues.

[REDACTED EEO/CISZ]

401. [REDACTED EEO/CISZ].

402. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

403. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

404. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

405. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

406. [REDACTED EEO/CISZ].

407. [REDACTED EEO/CISZ].

408. [REDACTED EEO/CISZ].

409. [REDACTED EEO/CISZ].

[REDACTED EEO/CISZ]

410. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

411. [REDACTED EEO/CISZ]

[REDACTED EEO/CISZ]

412. [REDACTED EEO/CISZ]

413. [REDACTED EEO/CISZ]:

[REDACTED EEO/CISZ]

414. [REDACTED EEO/CISZ].

415. [REDACTED EEO/CISZ].

416. [REDACTED EEO/CISZ].

417. [REDACTED EEO/CISZ].

418. [REDACTED EEO/CISZ].

419. [REDACTED EEO/CISZ].

420. [REDACTED EEO/CISZ].

421. [REDACTED EEO/CISZ].

[REDACTED EEO/CISZ]

422. [REDACTED EEO/CISZ].

423. [REDACTED EEO/CISZ].

424. [REDACTED EEO/CISZ].

425. [REDACTED EEO/CISZ].

426. [REDACTED EEO/CISZ].

UNPACKING AND REPACKING ISSUES

427. There was a large measure of agreement between the parties as to the general methodological approach to "unpacking" the comparable licence(s) once selected, i.e., calculating the effective rates implied by the comparable licences, and then "repacking" the CDL (i.e., adjusting the implied rates and applying them to the relevant expected sales or revenues covered by the CDL to give a lump sum figure).

428. At a high level, both valuation experts followed a similar stepwise analysis, which can be summarised as follows.

429. The first step is to determine the net consideration paid under the licence and then adjust that consideration to present value.

430. The next step is to identify the sales made and expected to be made under the licence. There was disagreement between the experts as to whether this assessment should be of sales revenue or sales volumes, which is a facet of the fundamental methodological dispute between the parties as to whether to use an *ad valorem* or DPU approach, which I address further below.

431. Actual sales data is used for sales made prior to the effective date of the licence and forecast data is relied on for future sales to be made under the licence. There was disagreement between the experts as to what forecast reports to use.

432. Although the parties are now in agreement on an assumed limitation period (i.e., where a licence includes a past release but does not give an explicit period for the same, 3 years should be used for China and Emerging Markets and 6 years for Developed Markets; there also being agreement on the definition of both markets), there remains a dispute between the parties as to whether lower royalties should be considered to be paid for past sales within the limitation periods and whether it was appropriate to unpack the licences as if the parties had included interest on the past sales.

433. From the above steps, one-way effective rates for each portfolio were derived and a calculation was done of implied rates by standard. There was a dispute as to the specific weightings to be used for the various standards. There was also a dispute as to an additional adjustment to be made to account for the relationship between 5G and 4G, discussed further below.

434. Once the rates are unpacked from the licences to be relied upon, two adjustments are necessary to determine the rates for the CDL. The first is a portfolio adjustment to account for differences in ZTE's portfolio strength as at the

execution date of the licence being unpacked and the valuation date of the CDL. The second is a geographic adjustment. The parties are agreed about how to adjust for one element of variation in the composition of non-ZTE portfolios (i.e., the Samsung licences) by reference to Samsung's distribution of sales by geography, by attributing 80% of the weight in a portfolio strength adjustment to US/EP and 20% to China. However, there is still a dispute as to what if any geographic adjustment should be made when repacking from ZTE licences with licensees other than Samsung, to account for the fact that Samsung has a different geographic sales distribution to other licensees. There is also a dispute as to whether to only include families with a granted member or also include families with applications when adjusting for portfolio strength.

435. Having derived the adjusted implied rates, these can then be applied to the expected sales/revenues covered by the CDL and interest applied. There is a dispute as to the rate of interest and whether Samsung should pay for all of its past sales.

436. Lastly, a point arose after trial when I was provided with the parties' calculations to which I referred at the start of this judgment. It concerns the treatment of expired patents in the unpacking. I deal with it at the end.

437. I turn to consider the disputed points.

Ad valorem or DPU approach

438. This was a fundamental methodological disagreement between the two valuation experts.

439. Given that [REDACTED EEO/CISZ] the licences to be unpacked in this case include lump sum payments for the parties' mobile handsets and infrastructure equipment, the first step in each expert's unpacking process was to split the consideration between mobile handsets and infrastructure equipment. The data for infrastructure equipment is only available in terms of revenues. As such, the unpacking of these licences required revenues of mobile handsets and infrastructure equipment to be able to allocate the observed balancing payment into notional balancing payments for mobile handsets and infrastructure equipment. Both valuation experts made this allocation. Having made that allocation, the experts adopted different methods to unpack the notional balancing payment for mobile handsets to derive the DPU rate for those products.

440. Dr Chowdhury unpacked the notional balancing payment for mobile handsets based on the parties' respective revenues of those products. This yielded the *ad valorem* rates for the parties' respective portfolios. Dr Chowdhury applied these *ad valorem* rates to the ASPs of the counterparty to derive the equivalent DPU rates underpinning the notional balancing payment for mobile handsets.

441. Dr Chowdhury provided the following example. In unpacking Samsung-[REDACTED EEO/CISZ], she estimated an *ad valorem* rate of [REDACTED EEO/CISZ] for [REDACTED EEO/CISZ] portfolio, which was payable by Samsung on its 5G handsets. This rate was based on her assessment that the licence covers Samsung's 5G handset revenues of [REDACTED EEO/CISZ] and

volumes of [REDACTED EEO/CISZ], implying an ASP of [REDACTED EEO/CISZ]. So, applying the rate of [REDACTED EEO/CISZ] to this ASP yielded a DPU rate of [REDACTED EEO/CISZ] for [REDACTED EEO/CISZ] portfolio on Samsung's 5G handsets.

442. Dr Chowdhury said that her analysis is internally consistent in the sense that she identified the amount of the notional balancing payment for mobile handsets based on the parties' revenues of these products, and then unpacked this amount based on those revenues.

443. Dr Lopez, after having identified the notional balancing payment for mobile handsets based on the parties' revenues, unpacked that payment based on the parties' volumes of those products to derive a DPU rate. ZTE's criticism of this approach was that it is inconsistent with Dr Lopez's approach of allocating the notional balancing payment between mobile devices and infrastructure using revenues. In oral closings, Samsung justified Dr Lopez's doing this and applying an *ad valorem* approach to infrastructure because base stations cost a great deal more than mobile handsets, so a DPU approach there would not make any sense. Samsung argued that it does not then follow that it is right to unpack the vast bulk of the licences, which relate to mobile handsets, on an *ad valorem* basis.

444. Samsung's criticism of Dr Chowdhury's approach was that she unpacked licences on an *ad valorem* basis without an ASP cap of any kind and then applied that rate to the likely estimated sales revenue under the repacked licence. As Samsung pointed out, and as Dr Chowdhury accepted in cross-examination, the DPU rates that she presented are rather an alternative presentation of her *ad valorem* analysis and not cross-comparable with the DPU rates that Dr Lopez derived from the licences.

445. Samsung submitted that an uncapped *ad valorem* analysis of this kind is wrong. Firstly, Samsung said that it is contrary to the evidence of the licensing experts that a cap would typically be applied at $200-400. Secondly, Samsung argued that an uncapped analysis is liable to give rise to serious distortions based on the delta between the ASP of the licensee under the licence to be unpacked and the ASP of the licensee under the licence to be repacked, which is reflected in the figure below that Samsung put to Dr Chowdhury during cross-examination, and which she accepted does reflect how her approach works:

Unpacking: $100m licence covering 100m expected units.

	Dollars per unit ("DPU")	**Ad valorem ("AV")**
Licensee A ($100 ASP)	$1	1%
Licensee B ($500 ASP)	$1	0.2%
Licensee C ($1000 ASP)	$1	0.1%

Repacking (same portfolio to be licensed): 100m expected units at $200 ASP.

	Implied lump sum (DPU)	**Implied lump sum (AV)**	**Chowdhury implied DPU**
Using Licence A	$100m	$200m	**$2**
Using Licence B	$100m	$40m	**$0.40**
Using Licence C	$100m	$20m	**$0.20**

446. I agree with Samsung that Dr Chowdhury's approach does have the significantly distorting effect illustrated here. It is also inconsistent with the licensing evidence and therefore does not reflect commercial reality.

447. I agree with Samsung that the different treatment of infrastructure is not an inconsistency which damages its argument. Some allocation of the lump sums in these licences between handsets and infrastructure has to be undertaken, and it is a different exercise from the unpacking and repacking which then needs to be done for the handsets.

448. So, I reject ZTE's criticism of Dr Lopez's approach and think it is much more sensible and accords with what has been done in previous cases such as *InterDigital v. Lenovo*.

449. This point has less impact in relation to the Samsung in-licences as potential comparables because one is unpacking and repacking for the same net licensee, but it is an important point for ZTE-Apple 2020.

Treatment of past sales – discount and interest

Discount

450. The first point in dispute is whether a discount should be applied to past sales and, if so, at what level. This dispute would be most material for ZTE-Apple 2020, the 2021 PLA, [REDACTED EEO/CISZ], i.e., licences with material past periods when they were made.

451. Dr Chowdhury's approach was to cap past sales by reference to express or assumed limitation periods and then apply an additional 50% or 90% discount for past sales. In closings, ZTE said that if I were to unpack ZTE-Apple 2020 or the 2021 PLA then I should do so based on an 80% past sales discount (which was a figure put to Ms Maghamé – see below). ZTE relied on the licensing evidence and previous decisions of this Court in support of its position.

452. As to licensing evidence, ZTE pointed to Mr Lin's evidence (both written and in cross-examination) that in his experience past sales are either waived completely or significantly discounted. Likewise, Ms Maghamé agreed that licensors do offer discounts on past sales and the level depends on the parties. This, said ZTE, reflects the fact that in practice past and future sales are not all valued in the same way, such that, for example, the sale of a unit forecast for the next year is not treated by the parties as equivalent in value to the sale of a unit sold 6 years ago. ZTE said that this is consistent with what this Court has consistently found on past sales *Optis v. Apple (Trial F)* [2021] EWHC 2564 (Pat) at [240(iv)], *InterDigital HC* at [393]-[397], [399], [444], [454]-[457], [517], and [728], and *Optis v. Apple (Trial E - Consequentials)* [2024] EWHC 197 (Ch) at [64(ii)]. ZTE acknowledged that arriving at a precise figure for each licence is an impossible task, particularly in the common case where a comparable licence just contains a single lump sum with no allocation between past and future, and argued that this materially adds to the uncertainty in unpacking licences with material past periods.

453. I think the reason ZTE now argues that I should go for an 80% past sales discount is based on its contention that "Ms Maghamé has experience of discounts as high as 80%" based on a document that was put to her in cross-examination, which was a transcript of her cross-examination in *InterDigital v. Oppo*. When asked in *InterDigital v. Oppo* whether a discount "could be more [than 50%]. It could be 80%, could it not", her reply was that it really depends on the parties and she stood by that response in her cross-examination at this trial.

454. Samsung argued that the licensing evidence does not identify standard industry practice as to the level of any past sales discount. Samsung said that Ms Maghamé's evidence was that a wide range of potential discount percentages may be proposed by licensors but that the extent of any such discounts will depend on the specific parties to that particular negotiation. She was aware of discounts being offered at less than 50% and has never encountered 90%. Ms Maghamé made clear that this is from a licensor's perspective and a licensee may view these discussions differently.

455. Further, Samsung argued that there is no evidence of an established industry practice of applying past sales discounts in addition to the application of limitation periods. Samsung pointed to the evidence given by Mr Lin during cross-examination, where he confirmed that even when licensors expressly referred to discounts for past sales during negotiations it was unclear whether that was intended to operate in respect of all sales or only those during a limitation period. Samsung contended that by applying assumed limitation periods, both valuation experts have already effectively applied a significant discount for past sales which amounts to an effective discount on past sales of 46% for ZTE-Apple 2020 and 54% for the 2021 PLA. So, said Samsung, this is a form of objective

valuation of the true value of the licence, recognising that it will in fact be payment for use of rights which are in principle recoverable.

456. Samsung also relied on the fact that in *InterDigital CA*, the uplift that had been applied to account for past sales discount, c.25%, was done in the context where the unpacking had been done without any allowance for limitation periods. Samsung thus argued that in the instant case, having already accounted for the impact of limitation periods in negotiations (i.e., the non-FRAND factor that the Court of Appeal corrected for) by applying limitation periods which were not applied in the unpacking in *InterDigital CA*, one does not need to make a further adjustment for an assumed additional discount. In any event, Samsung contended that the discount level put forward by ZTE was too high. Samsung contended that to the extent any past sales discounts were to be applied a lower percentage in the range of up to 25% would be a more appropriate reduction.

457. I do not agree that allowing for limitation periods inherently means that there is no need to account also and separately for discounts for past sales within the limitation periods. On the licensing evidence, the industry is currently going through a period of adjustment to the decision of the Court of Appeal in *InterDigital v. Lenovo* about limitation periods, but I think it is clear that in the past companies negotiating in this field assumed that limitation periods would apply to FRAND licences and that that limited and *capped* the possible recovery for the past. It was clearly however not the case that licensors recovered for all products sold back to the limitation period, up to that cap. They often had to reduce their demands still further, and often by a lot. I accept Mr Lin's evidence that in some cases licensors gave up on past sales altogether, subject to the point that that will always be hard to see in black and white terms where there is a single number for a lump sum given in a licence, and given the further uncertainty because licensor and licensee may have different interests in whether the lump sum is seen as being allocated to the past and/or to the future, with the ensuing effect on the headline royalty rate.

458. My conclusion is that a discount for past sales is appropriate in some cases, is fact dependent, is a value judgment, and when possible should reflect what happened in negotiations.

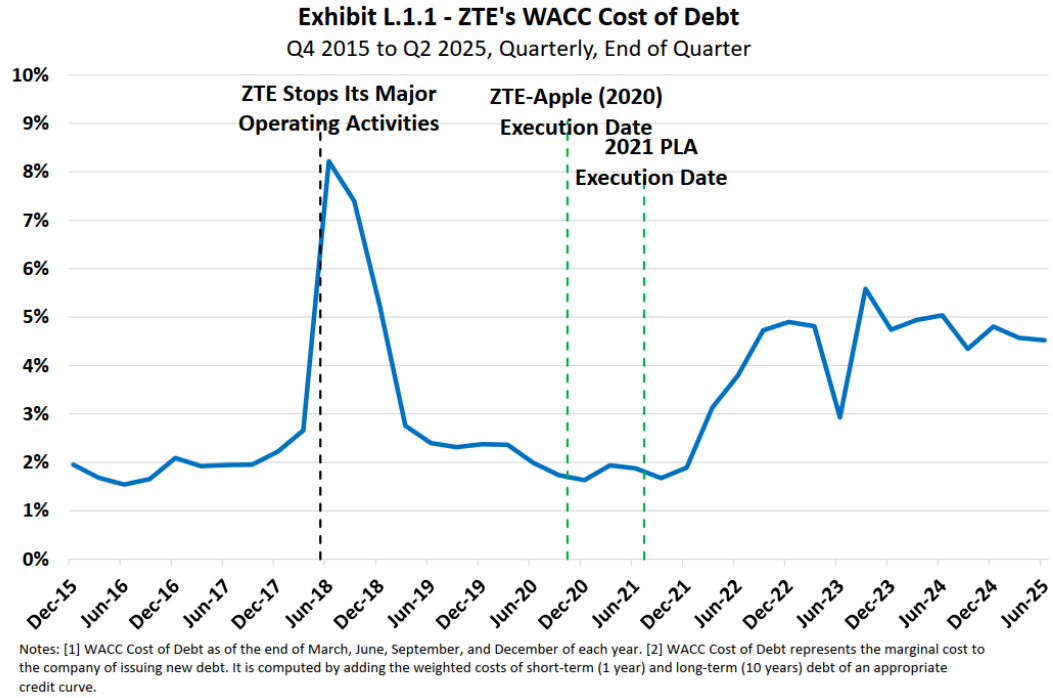
Interest

459. There is a dispute as to the rate of interest that Samsung should be paying on its past sales. ZTE contended that an interest rate of 5% is FRAND. Samsung contended that the US Treasury securities rate should be used instead.

460. ZTE relied on *InterDigital HC*, where the appropriate rate was held to be 4% based on the parties' agreement as to the figure for late payments in the CDL and that was cross-checked against the rates in other licences in that case. Similarly, in *Optis v. Apple (Trial E - Consequentials)* the Court again referred to late payment rates to find that a rate of 6% was FRAND. In the instant case, ZTE submitted that the parties had agreed 5% in the late payment provisions in the 2021 PLA and the draft terms of the CDL and that 5% has been the [REDACTED EEO/CISZ].

461. Samsung argued that this is not a case like *InterDigital v. Lenovo* or *Optis v. Apple* where the implementer had no previous licence with the licensor and, accordingly, the risk of incentivising hold out if interest was not applied (or was applied at too low a rate) was a real issue. It is a renewal licence at play in the instant case. Samsung argued that the only reason interest for past sales is being considered at all is because ZTE positively chose not to fully license 5G under the 2021 PLA. Samsung contended that it is inappropriate to rely upon reasoning designed to disincentivise hold out to seek to artificially inflate the interest rate payable and that ZTE should not be able to benefit from the fact that it deliberately chose to delay the time at which Samsung could take a full 5G licence. Samsung said that this is especially so where this rate setting action was commenced by Samsung before the expiry of the 2021 PLA and ZTE has never had any doubt about Samsung's ability to pay. Thus, said Samsung, it is inappropriate to make reference to a rate prescribed in late payment provisions.

462. As to what would compensate ZTE relative to its cost of borrowing, I was taken to the following graph:



Notes: [1] WACC Cost of Debt as of the end of March, June, September, and December of each year. [2] WACC Cost of Debt represents the marginal cost to the company of issuing new debt. It is computed by adding the weighted costs of short-term (1 year) and long-term (10 years) debt of an appropriate credit curve.

463. Although the US Treasury rate is not marked on that graph, counsel for Samsung during oral closings submitted that that figure would be lower than ZTE's cost of debt during the relevant period.

464. In my view ZTE is right on this issue. 5% is a realistic commercial rate reasonably (if imperfectly) reflecting the cost of borrowing to ZTE and supported by the late payment provisions of the comparables I have considered.

465. In closings there were residual disputes as to whether it is appropriate to unpack comparable licences as if the parties had included interest on the past sales and as a matter of repacking whether Samsung should pay interest on all of its past sales.

466. As to interest on past sales when unpacking comparables, ZTE relied on both licensing experts agreeing that in real life negotiations, interest on past sales is not in fact included. This, said ZTE, aligns with the findings of Mellor J in *InterDigital v. Lenovo (Form of Order Judgment)* [2023] EWHC 1578 (Pat) at [24]. I agree.

467. As to paying for all past sales, ZTE argued that it is now well and authoritatively settled by the Court of Appeal that willing parties would not apply limitation periods and would pay for all past sales (see e.g., *InterDigital CA* at [186]-[206]). This should include interest.

468. Dr Lopez took the view that there should be consistency, i.e. if interest should be applied when repacking then it should also be applied when unpacking. Samsung did not make much of a point on this during oral closings, only really saying that on either position it does not really make much of a difference to the figures in the final repacked CDL. In my view ZTE is clearly right about this and there is no inconsistency in its position. Looking at the past comparable licences is an exercise in valuing what actually happened; parties' non-inclusion of interest is part of what happened. By contrast, repacking involves a value judgment about how willing parties ought to behave, and willing licensees would not exploit a delay in making a licence by not paying interest for the period of the delay to their benefit and to the loss of the licensor.

Projecting future sales

469. Dr Lopez relied upon a number of different forecasts from third party analysts and calculated median year-over-year growth rate forecasts that he then applied to historical sales to derive a figure for future sales. Dr Chowdhury used only Counterpoint data, which provides forward-looking forecasts of handset sales for up to five years from the time of the execution of the licence. The significance of this difference in approach is illustrated in the following table taken from Lopez 2:

[REDACTED EEO/CISZ]

470. ZTE criticised Dr Lopez's approach on the basis that his approach (i) does not provide data for 4G and 5G specifically, but instead aggregates across all generations, such that Dr Lopez was forced to use ex-post data to estimate his 5G forecasts, and (ii) combines expected growth rates from different analyst reports for different periods such that when comparing across licences, Dr Lopez may be applying growth rates informed by different reports to the unpacking of different licences (and ultimately the repacking of the CDL). As such, different forecasting methodologies adopted by the different third-party analysts are applied at different points of Dr Lopez's analysis. In contrast, argued ZTE, the use of Counterpoint splits out 4G and 5G and ensures that a consistent forecasting methodology is used. ZTE argued that in any event, given that Dr Lopez relied on the median, Dr Lopez's approach will often end up using a single forecast for multiple years, so any benefit from using a basket of forecasts is limited.

471. ZTE further submitted that it can pick between FRAND terms and since players in the industry actually rely on Counterpoint forecasts, then it cannot reasonably

be suggested that it would be un-FRAND for ZTE to do so here. ZTE also contended that this is especially so when it was within Samsung's power to provide data as to its own contemporaneous forecasts to show that the Counterpoint forecasts are wrong, but Samsung chose not to do so.

472. Samsung argued that relying upon numerous sources is likely to give a closer approximation as to market expectations of future sales at the effective dates of each agreement. Dr Lopez explained that forecasting is an inherently uncertain exercise and by looking at the forecasts of different providers, it is possible to work out what the consensus view is. Whilst Dr Lopez accepted that Counterpoint would be used in negotiations by certain companies, he nevertheless considered his approach to be part of the due diligence that he would expect.

473. Dr Lopez criticised Dr Chowdhury's reliance on just Counterpoint on the following basis (and reflected in his graphs below from Lopez 2): (i) no explanation as to how Counterpoint forms its opinions, what evidence it considers, and whether its forecasts are above or below industry consensus, (ii) Counterpoint data is often an outlier when it is compared to other forecasts from financial analysts, (iii) Counterpoint data has tended to overestimate Samsung's smartphone revenues, particularly in later years, (iv) Counterpoint forecasts are substantially higher as regards ASPs for Samsung than the analyst reports, and (v) the overall effect of those points is to drive up the lump sums implied by Dr Chowdhury's *ad valorem* analysis.

[REDACTED COMINF]

[REDACTED COMINF]

[REDACTED COMINF]

474. Samsung submitted that in those circumstances, it is not safe to rely on Counterpoint data alone and the better approach is to look at the range of analysts' forecasts. I was also taken to graphs in Lopez 3 of outturn data that illustrated that Dr Lopez's approach has been more accurate as to what has actually happened in practice in comparison to Dr Chowdhury's approach. Samsung therefore submitted that Dr Lopez's forecasting approach is the one most likely to give a FRAND rate that will in fact accord with Samsung's actual sales going forward, and that given the expert evidence at trial, it would not be FRAND to adopt a forecasting approach based on Counterpoint only where such an approach is likely to overestimate Samsung's future revenues and therefore increase the lump sum payable under the CDL.

475. My conclusion on this point is that neither approach is perfect and no perfect approach exists, but that Dr Chowdhury's is to be preferred. I consider that in particular Dr Lopez's approach suffers from mixing and matching data sources across different periods which is inherently inconsistent. In addition, I find that there is force in the point that his use of the median means that his approach often will not in fact smooth out variations. Since I think that Dr Chowdhury's approach is objectively better I do not need to rely on the right of the patentee to choose among FRAND terms, but I do think that this is an example where the choice could have a legitimate part to play: as long as a data source was public

and reasonably often used in the industry a patentee might well want to frame its negotiations and licences by reference to that source, for consistency or simplicity, for example.

476. I did not find the reliance on outturn data appropriate or useful, and I think that is consistent with my view on the [REDACTED EEO/CISZ] on Samsung-Huawei 2022.

4G and 5G – multimode weightings and rate adjustment

477. Dr Lopez and Dr Chowdhury differed on the multimode weightings that they use. Dr Lopez adopted 70:20:10 (4G:3G:2G) for 4GMM devices and 50:40:5:5 (5G:4G:3G:2G) for 5GMM devices. Dr Chowdhury used 80:10:10 (4G:3G:2G) for 4GMM and 70:20:5:5 (5G:4G:3G:2G) for 5GMM.

478. As Samsung pointed out the multimode weighting in this case is most relevant when assessing the rate payable for Samsung's past sales of 5GMM devices.

479. Samsung's position is that Dr Lopez's multimode weightings are the more appropriate to use given that the economic evidence is that the rollout and availability of 5G has been limited and the licensing evidence is that there is not yet a market consensus as to 5GMM weightings.

480. As to 4GMM, Samsung argued that following *UPHC,* the ratio of 70:20:10 (4G:3G:2G) has been widely used and there is not sufficiently strong evidence of a consensus in the industry to justify moving away from that approach. ZTE's relied on Mr Lin's evidence that since *UPHC*, the 2G and 3G networks are increasingly being decommissioned and so contribute less. Instead, Mr Lin explained that an 80:10:10 weighting for 4GMM is "*fairly widely accepted*" in the industry.

481. As to 5GMM, Samsung argued for the 50:40:5:5 (5G:4G:3G:2G) decided by the Chongqing Court in *Nokia v. Oppo*. The Court described the relative contribution of 5G:

> … this Court believes that the evidence cited by the Parties comprehensively demonstrates 4G and 5G technology and their development, which can basically show that 5G technology has further expanded the industrial applications fields of communication technology. However, the current evidence fails to show that, when only looking at the smartphone industry, the current contribution of 5G technology is significantly higher than that of 4G technology. Especially considering that the agreement period at issue to be decided by this Court is still in the early stage of applying 5G technology into smartphones, the value contribution of 5G technology to 4G technology should not be overestimated. Therefore, Plaintiff's current understanding that 5G technology takes up half the entire value is relatively reasonable and should be adopted.

482. ZTE argued that the Chongqing Court's decision in *Nokia v. Oppo* seems to indicate that there was no expert analysis before that court or evidence of how

parties actually weighted the standards in practice. ZTE relied on Mr Lin's evidence, where he explained that the market considers the 5G component to be too low, particularly now in 2025 and that the 5G component should be higher and continue increasing into the future.

483. The evidence on this is not particularly compelling in either direction but there is benefit in acting consistently with the Chongqing Court and that is what I will do for 5GMM. The impact of the 4GMM weighting seems likely to be small and the difference between the experts is minor. However, Mr Lin's 80:10:10 was the starting point for the Chongqing Court to arrive at its 5GMM weightings so for further consistency I will take that.

484. As part of Dr Chowdhury's *ad valorem* approach, she included an additional 20% rate adjustment to account for an alleged premium reflecting the increased value of 5G royalties over 4G royalties.

485. Dr Lopez disagreed with this approach for detailed reasons given in his second report, including for example saying that Dr Chowdhury's analysis was based on an unduly small sample of comparing mobile phones which did or did not have 5G but were otherwise identical. There was relatively little exploration of this in oral evidence with either expert but Samsung's simplest objection to Dr Chowdhury's approach was that under her *ad valorem* approach the ASP differences between 5G and 4G units already incorporate a significant uplift. Further, Samsung pointed out that the licensing experts were in agreement that it is commonly understood that the royalty rates for 5G are *not* significantly more than that for 4G.

486. I agree with Samsung on this point. Dr Chowdhury's analysis is not well supported on the data; had I accepted her *ad valorem* approach then the ASP difference would already provide a 5G uplift anyway so there is a degree of inconsistency there, but more importantly it makes no sense to add an additional premium for 5G when the licensing experts agree that that is not the real world view. This point is, I should add, of only small potential impact anyway.

SEP families with only patent applications

487. The dispute here is whether to only include families with a granted member or also include families with applications only when calculating the relevant portfolio strength ratio. Samsung's position is that families should be limited to those with granted members whereas ZTE's position is that applications should also be included. This issue is material when unpacking and repacking from the Samsung licences, particularly Samsung-Huawei 2022, as can be seen from the following table taken from Lopez 2 which shows the effect that including applications has on the implied rates derived from each:

[REDACTED COMINF]

488. It can be seen that the effect of including applications can be large but is highly variable.

489. Samsung argued that ZTE's approach advantages a company which has proportionately more applications as part of its portfolio because those are given full weight (including where a single application can count as a family), despite it being known that a proportion will fail. Samsung said that that is not a safe representation of portfolio strength and has the effect that it almost always favours ZTE (as illustrated in the table above).

490. ZTE argued that the licensing evidence shows that parties would expect applications to be included within a licence without being thrown in for free. Samsung responded that that is not the same issue, as I am not considering here whether applications should be included within the licence, but rather whether using a definition of "family" which includes applications is appropriate when one is attempting to assess relative portfolio strength for the purposes of a scaling exercise. I agree with Samsung on that point: having a lot of applications may reflect a weaker portfolio but that does not mean they are or should be included for free.

491. ZTE also pointed out that its proportion of applications and grant rate were not materially different from other Samsung licensors, indeed that its grant rate was higher than many.

492. I conclude that the effect of including applications could be material and might be inappropriate if the portfolio of the licensor in the other comparable under consideration was very different from ZTE's according to these kinds of metrics. I cannot see that a single decision about the appropriateness of including applications can apply whatever the other portfolio under consideration. Since I have rejected using Samsung licences as comparables this issue will not have a major effect.

493. Dr Lopez said this factor would play a part even if using a ZTE out-licence as a comparable, because although ZTE would be the net payee there would still be a cross-licence of the other portfolio, but he said the effect would be small. Since I propose to use ZTE-Apple 2020 this effect would be small but it would still be present so I need to make a decision. In a situation where the effect is small and does not cause a major distortion I think it is better not to opt for an approach which does not give value to families with only applications. So they should be included. Ironically, I think this may reduce the amount that ZTE obtains.

494. I think this all illustrates once more that using comparables for other portfolios is complex and may be challenging and that using a comparable licence to the same portfolio is preferable.

Geographic adjustment

495. This issue concerns an adjustment made by Dr Lopez for the relative balance of sales in emerging versus developed markets when he was repacking the rates from ZTE's licences (other than the 2021 PLA, i.e., including ZTE-Apple 2020). There are two disputes that arise here.

496. Firstly, Dr Lopez calculated a rate for the CDL by unpacking ZTE's rate from the respective ZTE licences and adjusting for portfolio strength and geographical

sales. Dr Lopez's geographic sales adjustment took the respective sales distribution of the licensee (for example Apple) versus Samsung in Developed Markets, Emerging Markets, and China and applied a 50% discount to Emerging Markets (parenthetically, Dr Chowdhury criticised this approach on the basis that it is inconsistent to do it at the repacking but not the unpacking stage. Dr Lopez explained in his evidence that he did not do this simply because Samsung's sales volumes mean it would not make a difference. I do not think ZTE maintained this argument in closing submissions and I accept what Dr Lopez said on it).

497. So, I find that an adjustment of this kind is appropriate, a conclusion that ZTE did not resist, and the issue comes down to whether it is appropriate to use a 50% adjustment or whether a lower rate of 30% should be used for Emerging Markets.

498. ZTE argued for 30% on the basis that Ms Maghamé accepted that a discount of 30-35% is often agreed, and Mr Lin said that in his experience a benchmark often cited in relation to regional rates was that of the Via-LA Advanced Audio Coding Pool which provided for a discount of up to 30-35%. Samsung argued for 50% on the basis of what has been applied in case law such as *UPHC* and *InterDigital HC*, the regional discount offered by the Access Advance HEVC Patent Pool, and Dr Lopez's data on industry-wide ASPs between each relevant region for 4GMM and 5GMM handsets.

499. I prefer Samsung's position. The pool rates mentioned differ somewhat from one to another and are consistent with either side's position so do not assist in resolving the dispute. It may be that lower percentages than 50% are sometimes agreed, as Ms Maghamé mentioned, but I think she mainly had pools in mind and also acknowledged that rates go up to 50% as well. The most objective evidence is that of Dr Lopez on handset prices, which was not challenged in cross-examination, and that drives my conclusion on this point.

Expired patents

500. One part of unpacking involves devising a portfolio strength ratio, which I have referred to above in places. This reflects the relative strength of the portfolios of each of the two sides to a cross-licence. The disputed point is whether to include expired patents in the *denominator* when calculating stack shares. It is agreed that they should not be included in the *numerator*, which is essentially the same as saying that the parties should not be treated as actually having patents that have expired.

501. Samsung's position, supported by Dr Lopez, is that expired patents should be included in the denominator because when patents expire the technology they represent should be considered as passing to the public. So, it is said, one should consider the relevant patentee's current share of the whole technology.

502. ZTE on the other hand, relying on Dr Chowdhury's evidence, says that expired patents should not be included in the denominator. Dr Chowdhury explained her position in the context of the top-down cross-check, where this point could be more important, but paraphrasing rather heavily she said that what one ought to be concerned with is the actual aggregate royalty burden on licensees and not a theoretical allocation of the value of all possible technologies.

503. This point was barely mentioned at trial, just getting a passing mention in ZTE's opening skeleton, where it was said to have "only a tiny impact" on unpacking. I heard nothing about it in oral submissions at all and it did not feature in the parties' closing submissions. As it turns out, however, although its effect on unpacking is relatively small in percentage terms, it makes a difference of millions of dollars in absolute terms (about $8m in the light of my other findings), so I will decide the point.

504. I should say that it is not intuitively obvious why the point makes any difference at all, since one might think that using a different denominator on both sides of a ratio ought to cancel out, and the parties did not explain it. After some thought of my own, I think the reason it matters is that the ratio is derived and then used for each different generation of the standards, and the effect of expiring patents will be felt more heavily in the older generations. When one is concerned with unpacking ZTE-Apple 2020 the strength ratios are between ZTE's portfolio and Apple's and one might expect Apple's portfolio to be younger than ZTE's. So the effect does not just cancel out.

505. It is possible that, without having the help of the parties, I may have misunderstood the reason why this matters to some extent – though it clearly does matter – and I did consider asking for further submissions on it. I did not do so because the details of exactly why and how it matters are not necessary to my conclusion, which is that expired patents should not be included in the denominator. The reason is that unpacking ought to be concerned with the actual economic and business position as a matter of fact at the relevant point in time. The relative strength of the two parties' portfolios then has nothing to do with the position at some earlier point in history when there were more patents in existence, so I agree with Dr Chowdhury. Dr Lopez's point about the technology in expired patents passing to the public is a value judgment about how the world should be perceived, not about what the actual position in the real world was.

TOP-DOWN CROSS-CHECK

506. In support of its main case based on comparables, ZTE relies on a top-down cross-check. ZTE does not rely on it as a way to get to a specific eventual answer in terms of a money amount, but as a way to support its position for choosing the ENI licences as comparables over ZTE-Apple 2020, the 2021 PLA, or some or all of the NHDDS licences.

507. The top-down cross-check is a recognised methodology which has been deployed in a number of cases, and in other jurisdictions has been more central (notably China, and in the US in *TCL v. Ericsson*) and deployed as a method actually to work out the appropriate FRAND amount, not just as a check.

508. The basic idea is to take the rate in *ad valorem* terms for the licensor's (in this case ZTE's) portfolio as derived from a comparable licence by unpacking and repacking, and use it to work out the aggregate royalty burden ("**ARB**") that it would imply for the whole stack.

The parties' respective positions

509. ZTE contends that it is meaningfully possible to derive ARBs based on the candidate comparables in the case, and it says that the results are (at least broadly) as may be seen in the following Figure 1.1 from Dr Chowdhury's second report:

[REDACTED EEO/CISZ]

510. So, this shows the ARB based on each of the comparables, in percentages. The left hand side (first seven entries) is based on Dr Lopez's first report and the right hand side (last six entries) is based on Dr Chowdhury's first report. The two sets of entries overlap with ZTE-Apple 2020, the 2021 PLA, and Samsung-Huawei 2022 in both; different values are given because of the expert's differing approaches to unpacking/repacking explored elsewhere in this judgment. Only Dr Lopez's section covers the NDDS licences and only Dr Chowdhury's section covers the ENI licences. In addition, Dr Chowdhury's section gives values for "US count" in dark green; Dr Lopez preferred to use "Global count", shown in lighter green. Dr Chowdhury prepared Global count figures for the right hand section. These detailed differences do not have a material effect on my assessment of the utility of the top-down cross-check and I mention them for overall understanding of this important figure.

511. The dotted line just above 8% is said to be the ARB from *Optis CA*.

512. ZTE says that the absolute minimum ARB which has been accepted in past cases is in the order of 4.3-5.3% (for 5G in *Nokia v. Oppo* in Chongqing) to 6-10% (for 4G in *TCL v. Ericsson*) and it relies on the 8.4% which it says was accepted by the Court of Appeal in *Optis CA* (in fact the 8.4% is just one – the highest - of a number of figures mentioned by the Court of Appeal, which varied with ASP down to 3.9%). It also relies on evidence from the licensing experts about expectations in the industry.

513. ZTE pointed out in argument and in cross-examination that all the comparables relied on by Samsung are [REDACTED EEO/CISZ] this level, whether one uses Dr Lopez's or Dr Chowdhury's numbers. It said the figures from its comparables (primarily ENI, also Samsung-Huawei 2022) are much more sensible. It also said that its offer on which it relies in this trial, $731m, is [REDACTED EEO/CISZ] the amount Dr Chowdhury repacked for Samsung-Huawei 2022 ([REDACTED EEO/CISZ]), for which the ARB is [REDACTED EEO/CISZ] on Dr Chowdhury's numbers (or [REDACTED EEO/CISZ] using Global count), and that is so low as to be seen to be definitely reasonable.

514. Samsung's response is in a number of parts.

515. First, it said there is no consensus in the industry that this method is valid, or as to the appropriate overall ARB.

516. Second, it said that it is not safe to assume that all portfolios are sufficiently similar to allow this sort of across-the-board pro-rating.

517. Third, it said that the assumption behind the method that there can be a single global ARB is inappropriate because there may be significant differences in patent coverage from one jurisdiction to another (it referred specifically to Vietnam, a point Dr Lopez referred to repeatedly in his oral evidence although little in his written reports).

518. Fourth, it said that the analysis is extremely sensitive to stack share assumptions and to caps.

Analysis

519. My conclusions are as follows:

520. First, the method can have some utility in the right case. It has been accepted as part of the picture in a number of important previous decisions in a number of jurisdictions. It does not have general acceptance in licensing negotiations but it is used to a material extent, sometimes. In particular, licensees internally can think about what the implication of a licence would be if it applied to their whole businesses, and it is sometimes part of the bilateral negotiations. However, comparables remain much more important.

521. Second, it is true that there is no consensus as to the appropriate overall ARB, either among previous court decisions or in the industry, and this is true for 4G and for 5G. However, that would not mean that a top-down cross-check could not have value: if on scrutiny a licensee's preferred comparable at a trial could reliably and meaningfully be said to produce an ARB of only e.g., 0.3% then that might well be a reason to reject it, and/or, as a cross-check to validate a preference for some other comparable which instead reliably and meaningfully gave an ARB of, say, 4%. This, again, does not justify ignoring comparables.

522. Third, the approach does assume that all portfolios are generally similar which may or may not be justified and will have an effect on individual situations that needs to be borne in mind. This goes back to the issue of portfolio quality, considered above in the context of ZTE specifically in this case. Since I conclude there that ZTE's portfolio cannot safely be assumed to be average or comparable with other big portfolios, the utility of a top-down cross-check in relation to it is significantly undermined.

523. Fourth, the "Vietnam" point is only a minor part of the picture. If the very detailed analysis which it implies would be necessary is done, it might alter the ARBs for all the comparables but not the general picture as to which are higher and lower and in what proportion.

524. Fifth, the analysis is indeed extremely sensitive to stack share assumptions and to caps. Dr Chowdhury's chart assumed that ZTE had [REDACTED COMINF] of the 5G stack. If it in fact had only half of that, then the implied ARBs would all double. Caps also have a big effect, and the reason is (simplifying somewhat) that without a cap a royalty is spread over the cost of the whole device (which might be $1,000 or more for a high-end smartphone from Apple or Samsung) and thus comes out as a much lower rate than if a cap is applied so that the royalty applies only to a cap of $200 or $400. Caps of both $200 and $400 were

suggested by the licensing experts as being appropriate, but again there was no consensus in the industry and anyway the precise level of the cap is not material to my overall conclusion that the top-down cross-check is not useful in the present case.

525. Dr Chowdhury accepted both these points, and the aggregate effect can be striking: if ZTE's stack share was in fact only half what she assumed and a $200 cap was applied then all the ARBs would quadruple. The ENI rates would, on those assumptions, be grossly too high.

526. ZTE said that because the Samsung ASP at the relevant time was $400, the cap point had no effect (if the cap was $400). This does not work as a matter of mathematics because it does not account for Samsung phones with prices above $400, of which there are many, owing to its flagship ranges.

527. I agree with Samsung that the sensitivities to stack share and cap undermine the value of the top-down cross-check a great deal.

528. Sixth, although I am entitled to use the top-down cross-check, I am not obliged to do so. In *InterDigital HC*, Mellor J rejected InterDigital's top-down cross-check on the facts as unreliable and settled on a rate based on comparables instead. Although the Court of Appeal adjusted the rate he had awarded upwards for other reasons specific to the comparables, the ARB its conclusion implied was still only not much more than 1% (see [285]-[286]) and the Court of Appeal said he was justified in considering the comparables as preferable.

529. In the present case, my view on the comparables is that ZTE-Apple 2020 is a good comparable in terms of its scope and because it is a licence to the ZTE portfolio. I have concluded that it is however significantly affected by non-FRAND factors. I have concluded that although it is a significantly subjective exercise I can allow for those factors adequately. On the other hand, I have concluded that the ENI licences are not good comparables because they are to portfolios which may be and probably are very different from ZTE's, and are subject to non-FRAND factors which I would find it much harder to account for. The top-down cross-check is not advanced as an alternative to either of these, it is a potential *cross-check* to allow me to choose between them. For the reasons given above, the top-down cross-check is unreliable in numerous ways and is not such as to lead to me to reconsider my choice of ZTE-Apple 2020 over ENI (or indeed over Samsung-Huawei 2022).

530. I should also say that I think it is quite possible that if an ARB was calculated based on the ZTE-Apple 2020 lump sum result that I arrive at below (with the relevant unpacking and repacking principles I have decided, and the adjustment for non-FRAND factors), using a reasonable cap and assumptions about ZTE's stack share, it is quite likely that the result would be well above 1% and, allowing for the correct application of the scope of the 2021 PLA, getting on for some of the figures attributed to e.g., Samsung-Huawei 2022. This is not necessary to my decision but gives me comfort that my conclusion is at least probably not grossly out of line with other court decisions that have used top-down methods/ARBs more heavily.

NON-ROYALTY TERMS

531. Although the main dispute at trial by far was the appropriate FRAND royalty, there was also a disagreement about some non-royalty terms.

532. The non-royalty terms in issue were as follows:

i) The scope of the patents to be included, which on Samsung's draft of the model licence for the CDL is as follows:

> **1.19** "**Licensed SEP(s)**" means all Licensed SEP(s)-1 and Licensed SEP(s)-2.
>
> **1.20** "**Licensed SEP(s)-1**" means any Patent: (a) including at least one patent claim that is Technically Essential to at least one standard of the Licensed Standards-1; or (b) having been declared by its owner to be essential (or potentially essential) to at least one standard of the Licensed Standards-1, regardless of whether any of its claims are actually Technically Essential to any Licensed Standard-1; together with any continuations, continuations in part, divisionals, foreign counterparts, re-examinations, and reissues of any such Patent.
>
> **1.21** "**Licensed SEP(s)-2**" means any Patent: (a) including at least one patent claim that is Technically Essential to at least one standard of the Licensed Standards-2; or (b) having been declared by its owner to be essential (or potentially essential) to at least one standard of the Licensed Standards-2, regardless of whether any of its claims are actually Technically Essential to any Licensed Standard-2; together with any continuations, continuations in part, divisionals, foreign counterparts, re-examinations, and reissues of any such Patent.
>
> **1.22 "Licensed Standards-1"** means the Wi-Fi Standard and the Bluetooth Standard published by IEEE, and the 2G, 3G, 4G and 5G cellular radio access network specifications published by 3GPP and the ITU and adopted by one or more relevant local standardization bodies, such as ETSI, TIA, T1P1, ARIB, TTC and CCSA, in each case irrespective of the transmission medium, frequency band or duplexing scheme. For the avoidance of doubt, the term "Licensed Standards-1" includes other standards normatively referred to in the standards identified above (including AMR-NB, AMR-WB, AMR-WB+, EVS and eSIM), and includes further updates and evolutions of the standards identified above, solely to the extent that any such updates or evolutions do not fundamentally alter the overall technical character of the standard in question.
>
> **1.23 "Licensed Standards-2"** means the AAC Standard, the ATSC 3.0 Standard, the DVB-T2 Standard, the HEVC Standard, the VC-1 Standard, and the VVC Standard.

ii) A mutual standstill clause, which on Samsung's draft of the model licence for the CDL is as follows:

> **3.5 Mutual Limited Standstills and Tolling Agreement**
>
> **3.5.1 Limited Standstills Under Some ZTE Patents:**
>
> (a) *ZTE Standstill.* Subject to ZTE's timely receipt of the Payment (as defined in Section 4), subject to the provisions of Section 4.1.1, subject to Samsung's compliance with the terms set forth in Section 3.5.2, and subject to the terms set forth in Section 3.5.1(b), during the Term, ZTE, on behalf of itself and its Affiliates, agrees that neither ZTE nor any of its Affiliates shall assert (or voluntarily cooperate with, instruct, or encourage any Third Party to do so) any Claim against Samsung, any Affiliate of Samsung, or any of their direct or indirect customers, downstream channels and end-users, under any ZTE Patent, for any activity related to any Samsung Standstill Product during or prior to the Term, solely to the extent such activity would be authorized under Section 3.1 if such Samsung Standstill Product were a Samsung Licensed Product.
>
> (b) *Standstills are Non-Exhaustive; Tolling of Claims*. Samsung acknowledges and agrees that: (i) ZTE's agreement to, and/or compliance with this Section 3.5.1 during the Term shall not be deemed or construed to (x) grant or exhaust any patent rights (whether express or implied) or (y) waive any rights, damages, or remedies that would otherwise be available; (ii) during the Term, the statutory period of recovery under 35 U.S.C. § 286 (and any similar foreign legal provision) and all time-based defenses (e.g., statutes of limitations, laches, and equitable estoppel), including calculations of time thereunder and the running of any deadlines therewith, shall be tolled as of the Effective Date for the duration of such the Term; and (iii) for the avoidance of doubt, after the expiration or termination of the Term, each of ZTE, any ZTE Affiliate, and any Third Party, shall retain the right to assert any Claim and to seek any remedy available at law and/or in equity with respect to any product or activity that would have been subject to the terms of Section 3.5.1(a) prior to such expiration or termination.
>
> **3.5.2 Limited Standstill Under Some Samsung Patents:**
>
> (a) *Samsung Standstill.* Subject to ZTE's timely receipt of the Payment (as defined in Section 4), subject to the provisions of Section 4.1.1, subject to ZTE's compliance with the terms of Section 3.5.1, and subject to the terms of Section 3.5.2(b), during the Term, Samsung, on behalf of itself and its Affiliates, agrees that neither Samsung nor any of its Affiliates shall assert (or voluntarily cooperate with, instruct, or encourage any Third Party to do so) any Claim against ZTE, any Affiliate of ZTE, or any of their direct or indirect customers, downstream channels and end-users, under any Samsung Patent, for any activity related to any ZTE Standstill

Product during or prior to the Term, solely to the extent such activity would be authorized under the terms of Section 3.2 if such ZTE Standstill Product were a ZTE Licensed Product.

(b) *Standstills are Non-Exhaustive; Tolling of Claims*. ZTE acknowledges and agrees that: (i) Samsung's agreement to, and/or compliance with this Section 3.5.2 during the Term, shall not be deemed or construed to (x) grant or exhaust any patent rights (whether express or implied) or (y) waive any rights, damages, or remedies that would otherwise be available; (ii) during the Term, the statutory period of recovery under 35 U.S.C. § 286 (and any similar foreign legal provision) and all time-based defenses (e.g., statutes of limitations, laches, and equitable estoppel), including calculations of time thereunder and the running of any deadlines therewith, shall be tolled as of the Effective Date for the duration of the Term; and (iii) for the avoidance of doubt, after the expiration or termination of the Term, each of Samsung, any Samsung Affiliate, and any Third Party, shall retain the right to assert any Claim and to seek any remedy available at law and/or in equity with respect to any product or activity that would have been subject to the terms of Section 3.5.2(a) prior to such expiration or termination.

iii) A mutual springing licence provision, which on Samsung's draft of the model licence for the CDL is as follows:

3.6 Springing Licenses Conditioned on and Immediately Prior to Transfer

3.6.1 ZTE Springing Licenses:

Subject to ZTE's timely receipt of the Payment (as defined in Section 4), and subject to the provisions of Section 4.1.1, if ZTE or any of its Affiliates sells, assigns or otherwise transfers ownership of, or substantially all of the beneficial rights in (any such transaction a "**Transfer**") any ZTE Patent to any Third Party (each such Transferred ZTE Patent a "**Divested ZTE Patent(s)**"), at any time during the Term, ZTE, on behalf of itself and its Affiliates, as licensors, hereby grants to Samsung and its Affiliates, as licensees, under each such Divested ZTE Patent, effective immediately prior to the Transfer Date, a fully paid up, worldwide, non-transferable (except to the extent permitted pursuant to Section 8.3.2) and non-exclusive license, with no right to grant any sublicense, under each such Divested ZTE Patent, solely during the Term and the term of any subsequent agreements, to make, have made, use, import, export, sell, offer for sale, develop, distribute, and/or otherwise dispose of all Samsung Licensed Products and Samsung Standstill Products, and to practice any method in such Divested ZTE Patent in connection with any of the foregoing authorized activities with respect to any Samsung Licensed Products and Samsung Standstill Products. Additionally, effective immediately prior to any such Transfer, the release by ZTE, as set forth in Section 2.1, shall extend

to any infringement of such Divested ZTE Patents by any Samsung Licensed Product and/or any Samsung Standstill Product during the period from the Effective Date to and including the date of such Transfer of such Divested ZTE Patent.

3.6.2 Samsung Springing Licenses:

Subject to ZTE's timely receipt of the Payment (as defined in Section 4), and subject to the provisions of Section 4.1.1, if Samsung or any of its Affiliates Transfers any Samsung Patent to any Third Party (each such Transferred Samsung Patent a "**Divested Samsung Patent(s)**"), at any time during the Term, Samsung, on behalf of itself and its Affiliates, as licensors, hereby grants to ZTE and its Affiliates, as licensees, under each such Divested Samsung Patent, effective immediately prior to the Transfer Date, a fully paid up, worldwide, non-transferable (except to the extent permitted pursuant to Section 8.3.2) and non-exclusive license, with no right to grant any sublicense, under each such Divested Samsung Patent, solely during the Term and the term of any subsequent agreements, to make, have made, use, import, export, sell, offer for sale, develop, distribute, and/or otherwise dispose of all ZTE Licensed Products and ZTE Standstill Products, and to practice any method in such Divested Samsung Patent in connection with any of the foregoing authorized activities with respect to any ZTE Licensed Products and ZTE Standstill Products. Additionally, effective immediately prior to any such Transfer, the release by Samsung, as set forth in Section 2.2, shall extend to any infringement of such Divested Samsung Patents by any ZTE Licensed Product and/or any ZTE Standstill Product during the period from the Effective Date to and including the date of such Transfer of such Divested Samsung Patent.

533. "Samsung Licenced Products" means any and all mobile devices and infrastructure equipment manufactured by Samsung, whereas "Samsung Standstill Products" means any and all complete speaker systems, TVs, and home appliances manufactured by Samsung that are compliant with the Bluetooth Standard and/or the Wi-Fi Standard. "ZTE Patents" means any and all patents that are owned, controlled, or licensable by ZTE during the term of the licence.

534. This dispute is really in two parts: (1) should FRAND terms cover non-cellular SEPs and NEPs to the extent that those patents would be infringed by Samsung's cellular products in the absence of a licence? And (2) should the terms cover Samsung's non-cellular products such as speakers and televisions to the extent that those products would need licences to ZTE Patents?

535. Samsung says "yes" to both. ZTE says "no" to both, but that although it has no obligation to do so it has offered a meaningful standstill (not a licence) in relation to (1).

The parties' respective positions

536. Samsung's position is that the 2021 PLA [REDACTED EEO/CISZ]both include terms of the breadth for which it contends in relation to these additional categories of patents and products. It says that if FRAND is to be assessed by reference to those as comparables then it would be discriminatory for ZTE not to give it the same terms. It says that the "ND" requirement can extend to patents and technologies other than cellular SEPs, on the authority of *Lenovo v. InterDigital* [2024] EWHC 1036 (Pat) and *Alcatel v. Amazon* [2024] EWHC 1921 (Pat). However, those cases only held that the point was arguable, as Samsung accepted. I now have to decide it.

537. Samsung also points to the fact that in negotiations for renewal of the 2021 PLA, ZTE accepted (in May 2025) that there were no FRAND issues to a renewal on the same terms, other than extension to cover 5G fully, and price. This was covered in evidence by Mr Chang, and Mr Tong essentially accepted the thrust of it in cross-examination, I find. In other words, at that stage ZTE had no objection to the non-royalty terms for which Samsung now contends.

538. Samsung also relies in a general sense on what it calls "patent peace", which it says would not be provided if, on the day after a renewal was made, ZTE could sue it on patents other than cellular SEPs, and/or for non-cellular products.

539. ZTE's response is that in terms of discrimination [REDACTED EEO/CISZ]. It points out that *UPSC* establishes that the "ND" part of FRAND does not require "hard-edged" non-discrimination and says that that is all that Samsung is really arguing for. It says that the ETSI FRAND obligation simply does not extend to anything other than cellular SEPs and certainly not to licensing non-cellular products. It says that it offered patent peace for all Samsung cellular products. And it says that as the licensor it has the right to choose FRAND terms, one version of which would not include anything other than cellular SEPs, and another version of which would be limited to cellular products only.

540. ZTE's proposal which it said would give patent peace came in inter-solicitor correspondence during trial. It is for a "tolling" standstill during a renewal of the 2021 PLA for all patents covering cellular products, but with no cover for non-cellular products. "Tolling" means that sales by Samsung during the renewal would not be licensed and would have to be paid for after the end of the renewal, with limitation periods paused. So, Samsung could not be sued during the renewal but it would run up what might be a significant liability, with interest.

541. Samsung responded that [REDACTED EEO/CISZ]. It said that the ZTE "patent peace proposal" made during trial does not really provide peace because of the tolling standstill and the non-coverage of non-cellular products, and it said that the patentee's right to choose has no application because the renewal would be a cross-licence and it therefore has its own right to choose. It also pointed out that if relevant comparables put forward by either side *do* cover these additional patents and/or products and the CDL does not, then there needs to be a financial adjustment for the removal of something valuable, but ZTE proposed no solid way to do that (although I note that in oral submissions ZTE did suggest that an

adjustment can be made if the non-royalty terms were limited to cellular SEPs; I briefly address this under my analysis below).

Overview

542. This is a relatively small issue in the context of this case. Compared with the detailed argument and evidence on the FRAND price it received little attention in the oral argument and in the written submissions and almost no attention at all in the evidence.

543. Given that ZTE had no objection to the inclusion of terms covering these patents and products in a FRAND licence renewing the 2021 PLA when the parties were negotiating (and on that I accept Mr Chang's evidence, which Mr Tong essentially assented to), I have been uncertain why the issue matters in real commercial terms. I think it was for ZTE to explain why it now objects to the inclusion and it has not done so. I am left with the impression, I have to say, that it is just being awkward for the purposes of the litigation and there is no real commercial interest engaged.

544. Despite not seeing the issue as a major one, and despite the lack of an explanation from ZTE about why it cares, I must decide it. I have come down on Samsung's side, but I make clear that I am not making any far-reaching or general conclusion about how FRAND applies to non-cellular patents/products, or to NEPs. The forthcoming RAND trials in the ITU-T context in this jurisdiction have the issue of NEPs (and encoding patents whose SEP status is disputed) front and centre in very different contexts where the patentees have taken, they say, longstanding and much more closely reasoned objections to such "other" patents falling under the RAND regime. Nothing in this judgment in any way prejudges those cases, which are likely to be much more fully argued in contexts where major commercial interests are said to be engaged.

545. It is also important to reiterate that ZTE has not undertaken to offer any FRAND terms that I identify so I am not compelling ZTE to license non-cellular patents or products.

Analysis

546. I begin with the issue of patentee's choice. On this, I agree with ZTE that the patentee has a significant degree of choice. In general, a patentee can choose between FRAND options. I do not think this being a cross-licence situation sterilises that or results in a sort of score-draw where neither party has the capacity to choose. There is no reason why, in a cross-licence, each side cannot independently choose how to licence its own patents or whether to include non-FRAND-encumbered patents. In addition, a situation where neither side had the option to choose would be impractical and I think could result in an undesirable deadlock.

547. However, I do not see that the patentee's ability to choose need necessarily be an overwhelming factor in every situation. In principle it might exercise the choice unreasonably, or unfairly, which might then not be [F]air or [R]easonable. I think some rational basis for the choice ought usually to be presented if a challenge is

made. The basis might be quite minor, even perhaps as simple as consistency with the patentee's established internal reporting or similar. In general, the Court ought I think to be very ready to accept the validity of the choice. In my view there was all the greater need for an explanation given that ZTE has withdrawn something it previously agreed to, and something that was part of the parties' longstanding arrangement under the 2021 PLA.

548. In the present case, [REDACTED EEO/CISZ] licences positively relied on by the parties as comparables (i.e., including ZTE out-licences and Samsung in-licences) do cover "other" patents and/or products. [REDACTED EEO/CISZ]

549. I agree with ZTE at a high level that the fact that the non-royalty provisions that Samsung wants were in the 2021 PLA cannot itself be conclusive, since ZTE might have changed its licensing practice in the meantime, or might rationally want to do so now, and that licence has expired anyway. It also cannot found an allegation of discrimination because it does not reflect the position of any other licensee.

550. I also agree that the mere fact that [REDACTED EEO/CISZ] had much the same non-royalty provisions does not entitle Samsung to them automatically; such is the consequence of the fact that the "ND" part of FRAND is not "hard-edged". But it is part of a building picture [REDACTED EEO/CISZ].

551. However, those two points on which I agree with ZTE are rather abstract and general. More concretely, it is in my view very important that the parties agreed in 2025 in the context of renewal negotiations to replicate the 2021 PLA, apart from the expansion to (full) 5G and apart from price. Clearly including the other patents and products was *a* FRAND option so far as the parties and particularly ZTE were concerned. FRAND is a process as well as a destination and while I do not doubt that ZTE could later have justifiably changed its mind if it had reasons, and especially if it introduced and implemented the change in a fair and reasonable way, that is not what it has done. Instead, and without giving reasons, it has changed its mind close to the resolution at this trial of what FRAND terms would be. In the absence of an explanation, I conclude that ZTE's exercise of choice on this point is tactical and designed to cause uncertainty.

552. ZTE's offer of "patent peace" is considerably less good than what the 2021 PLA [REDACTED EEO/CISZ] provided, and than what was agreed in the parties' 2025 negotiations, owing to the tolling point and the omission of non-cellular products. Those considerations are relevant to the FRAND assessment of it and of the manner of its introduction.

553. In addition, I think that the inclusion or otherwise of licences covering these other patents/products obviously has some financial value, albeit probably modest compared with the value of the cellular SEPs. If working from comparables that did include them to FRAND terms that did not, I would have needed to make a financial adjustment for this. As I mentioned above, in oral submissions ZTE suggested that such an adjustment can be made. However, the only evidence that it referred to as to what adjustment could be applied to account for this was Dr Chowdhury's 12.5% as a sensitivity for just [REDACTED EEO/CISZ], and which was done only in the particular context of the ENI licences. In my view,

in the FRAND process the obligation was on ZTE to propose a rational way to allow an adjustment to be made, and it has not; the approach outlined in oral closing submissions was far too sketchy.

554. I therefore conclude that the non-royalty terms for which Samsung argues are one FRAND structure and in combination with the lump sum I have determined are FRAND. Although ZTE could have proposed another structure with rational reasons for it, and with an appropriate financial adjustment (and insisted on its choice if it was FRAND), it has not done so. Its withdrawal of its previous agreement along with its omission to propose an appropriate and workable alternative is not FRAND conduct. The only FRAND structure before me in terms of these non-royalty points is the one sought by Samsung and previously accepted by ZTE.

STEPS TO THE FRAND LUMP SUM FOR THE CDL

555. In the light of all the reasoning above, I now draw together the threads and set out the steps which I conclude are to be applied to get to the FRAND lump sum for the CDL in the circumstances of this case.

Basic approach and choice of comparable

556. The basic approach is the use of comparables, as is common ground.

557. The starting point is to consider whether the Big Two are useful comparables. I conclude that they potentially are and that ZTE-Apple 2020 is to be preferred, for reasons given above. Using ZTE-Apple 2020 as the appropriate comparable requires unpacking and repacking and a series of adjustments to account for various differences for non-FRAND factors. I have described these above and get into the detail a bit more below. I think they can be made with sufficient confidence that it remains appropriate to use ZTE-Apple 2020 as a comparable. Using both of the Big Two would amount to combining a good comparable with a less good one, which would be impractical and contrary to the *Cimetidine* guidance, reiterated in the later case law.

558. From the ZTE out-licences, the VOX agreements are not contended for by either side but anyway are not useful.

559. I reject ENI for reasons given above (mainly portfolio differences and inability to quantify the effect of the non-FRAND factors which are clearly at play). It is not necessary to consider NDDS as candidates in their own right since ZTE did not argue for them and Samsung only argued for them in the event that I decided to use Samsung in-licences rather than ZTE out-licences. However, looking at all the Samsung in-licences in the round there is so much variation and so many difficulties in assessing what drives it that they are unreliable and there is no sound route to prefer ENI over NHDDS.

560. I should look at the whole situation in the round and had I thought that there were major problems with using the Big Two or ZTE-Apple 2020 specifically then I would have been open to taking a more lenient view of the Samsung in-licences.

But I do not think that and anyway the Samsung in-licences are much more problematic. I have rejected the top-down cross-check as a basis for preferring the Samsung in-licences for reasons given above.

Adjustments to the payment under ZTE-Apple 2020

561. The pressures that ZTE was under, as described in my analysis of the facts, led to a lower overall lump sum being agreed with Apple. This is a little subjective but my assessment is that:

    i) ZTE effectively gave a reduction of 12.5% (one eighth) because it was concluding its first out-licence (essentially equal first with Samsung). This is at the top end of the range identified for that kind of "discount" by Dr Lopez, and I also assess that in the light of all the surrounding circumstances it is right in absolute terms;

    ii) In addition, ZTE achieved a somewhat depressed amount for its 5G portfolio, to be represented by another reduction of 5% in the lump sum. This is only a modest adjustment because unlike with Samsung, ZTE was not so rushed by Apple that it did not have the chance to negotiate on 5G. But it did have to carry on the negotiation when it was ill-prepared and it may reasonably be inferred that this advantaged Apple, who insisted on the inclusion of 5G.

562. The combined effect of these is that the lump sum paid should notionally be treated as 21% higher (100/(100-(12.5 + 5)%, rounded to the nearest percent).

Treatment of past sales under ZTE-Apple 2020

563. As to the treatment of past sales under ZTE-Apple 2020:

    i) The parties at this trial agreed to the application of assumed limitation periods. In addition;

    ii) The general pressure on ZTE from sanctions and associated need for rapid cash was severe and can be best reflected (though with a broad axe) as a past sales discount of 80% notionally having been given (on top of the first licence discount and 5G reduction). I think this is a realistic reflection of the negotiations although I acknowledge that [REDACTED EEO/CISZ].

    iii) Unpacking should be on the basis that the parties to ZTE-Apple 2020 did not allow for interest on past sales.

564. I should make it clear that the allowances I have made to the lump sum and for the past sales are not cleanly divided in their causes or justifications. It is not feasible to be as surgical as that.

Unpacking ZTE-Apple 2020 – other points

565. The approach used for handsets should be Dr Lopez's DPU approach and not Dr Chowdhury's *ad valorem* approach.

566. Assumed future sales have to be calculated and that should be on Dr Chowdhury's approach using Counterpoint data.

567. Appropriate MM weightings have to be applied and the correct ones are Mr Lin's/Dr Chowdhury's 80:10:10 (4G:3G:2G) for 4G and Dr Lopez's 50:40:5:5 (5G:4G:3G:2G) for 5G, i.e., the Chongqing Court's approach.

568. It is not appropriate to make a further 5G versus 4G adjustment; Dr Lopez's analysis with long term ASP differences should be used.

569. Expired patents should not be included in the denominator for the PSRs.

Repacking

570. Dr Lopez's adjustment for relative balance of sales in emerging markets etc having regard to the different businesses of Samsung and Apple should be applied. The percentage discount used should be 50%.

571. Samsung's acts to be taken into account are to be assessed on the basis that it is correct about the two points of interpretation of the 2021 PLA. This is the approach Dr Lopez took.

572. All past sales not covered by the 2021 PLA should be included and paid for. No limitation periods apply. Interest should be allowed for, at 5%.

573. Patent families with applications only should be included when calculating relevant portfolio strength ratios.

Result on the FRAND lump sum

574. As I have mentioned in the introduction to this judgment, at my request during the preparation of my judgment and subject to terms of confidentiality the parties with the help of their valuation experts and their teams, to whom I am very grateful, provided a spreadsheet to calculate the FRAND lump sum balancing payment in the CDL, with appropriate options for the interpretation of the 2021 PLA and the past sales discount, and on the basis of all my decisions on the unpacking/repacking points above, which I communicated to them. The spreadsheet had two options for the CNS issue and three options for the past sales discount. It also catered for the two different positions on the issue of inclusion of expired patents.

575. The first version of the spreadsheet did not have a means to factor in percentage adjustments for first licence and depression in 5G. To do that I manually added the 21% referred to above, giving the final number of $392m. In finally opting for this number I tried the various options for past sales discount in the spreadsheet and a variety of different choices for the first licence and 5G depression to get a sense of the effect of the various factors and an appreciation of the overall fairness of the result, but I made the initial choices of 80%, 12.5% and 5% prior to receiving the spreadsheet and for the individual reasons for each given above. My assessment of overall fairness was a check on the effect of those

numbers, not a driver of them. A second version of the spreadsheet automatically calculated the result based on percentage uplifts, and confirmed my manual work.

CONCLUSION

576. The FRAND lump sum balancing payment for the Court-Determined Licence as a renewal of the parties' 2021 PLA is $392m. This result is on the basis of my conclusions that (i) Samsung is correct about the scope of the 2021 PLA and (ii) Samsung's proposals for the disputed non-royalty terms in the Court-Determined Licence, which are the same as were in the 2021 PLA.

577. I will hear the parties as to the form of order and as to the inevitable issues over confidentiality and redaction. I direct that time for seeking permission to appeal will not start to run until the form of order hearing. I invite the parties' proposals as to when that should be; it must not be delayed too long but inevitably may take longer than usual to the extent that third party input about confidentiality is needed.

ANNEX - PARTIES' JOINT AGREED SUMMARY OF PROPOSED COMPARABLES

ZTE-Apple 2020	
Cross-licence Term: [REDACTED EEO/CISZ] Cellular SEPs [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
ZTE-Samsung 2021	
Cross-licence Agreement Term: 1/1/2021 – 31/12/2024 Licence Term: 1/1/2021 - 31/12/2023 CNS Period: 1/1/2024 - 31/12/2024 Cellular SEPs; other SEPs; NEPs. NB "5G SEP(s)", as defined at clause 1.62 of the 2021 PLA , are excluded.	Mobile devices & infrastructure, save for "5G Only Functionality" [REDACTED CBP] Full release save for 5G Only Functionality
ZTE-vivo 2024	
Cross-licence [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
ZTE-Oppo 2024	
[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
ZTE-Xiaomi 2024	
[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]

Samsung-Ericsson 2021	
Cross-licence Term: 1/1/2021 –[REDACTED EEO/CISZ] 2G-5G Cellular SEPs [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] Renewal agreement [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
Samsung-Nokia 2023	
Cross-licence Term: 1/1/2023 –[REDACTED EEO/CISZ] 2G-5G Cellular SEPs [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] Renewal agreement
Samsung-InterDigital 2023	
One way licence to Samsung Term: 1/1/2023 – 31/12/2030 [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] $1.05bn [REDACTED EEO/CISZ] Renewal agreement Result of arbitration [REDACTED EEO/CISZ]

Samsung-NEC 2022	
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
	[REDACTED EEO/CISZ]
	[REDACTED EEO/CISZ]
	[REDACTED EEO/CISZ]
Samsung-Huawei 2022	
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
2G-5G Cellular SEPs	[REDACTED EEO/CISZ]
[REDACTED EEO/CISZ]	[REDACTED EEO/CISZ]
	[REDACTED EEO/CISZ]

Samsung-Docomo 2023	
[REDACTED EEO/CISZ] Term: [REDACTED EEO/CISZ] 2G-5G Cellular SEPs [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
Samsung-Datang 2024	
[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]
Samsung-Sharp 2024	
[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] 2G-5G cellular SEPs [REDACTED EEO/CISZ]	[REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ] [REDACTED EEO/CISZ]