Smart meters, smart metering and standard essential patents

Robert Pocknell and Graham Bell

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Technical standard-setting is everywhere in the modern economy. As more and more industries come to rely on communications, effective deployment of standards for charging and for wireless and wired communications and interfaces has become critical to industry, government and consumer interests. When industry collaborators create technical standards, competition concerns need to be considered in case standards participants misuse their advantageous position in establishing industry standards to blacklist competitors (such as by refusing to offer access to standardized technologies) or to force customers to use only their own proprietary technologies, or to force companies to pay excessive prices.

To overcome potential misuse of the advantages for participants in the standardisation effort, standard-setting organisations (SSOs) commonly require that participants promise to license any patents that are essential to use of the standard (Standard Essential Patents (aka SEPs)) on fair and reasonable and non-discriminatory (FRAND) terms. This commitment is designed to ensure that licenses to these patents are available, on FRAND terms, to all companies that wish to use the standard. After a standard is developed and adopted, companies that hold associated SEPs, either the original patent applicants, or subsequent non-practicing entities, can obtain significant market power as a result.

In this article we shall discuss some of the industry issues for smart meters and smart meter charging and we shall explore some of the potential SEP claims that may be made, as well as some of the issues to be considered when negotiating SEP licenses.

Standards in smart meters

Smart meters are used in the gas, water, electricity and heating industries. There are multiple standards that have been developed, and that are under development, in Europe, the USA and elsewhere in relation to smart meters. These include measurement standards, performance standards, safety standards, cybersecurity standards, and environmental and durability standards.

In order to be “smart”, meters require some form of connectivity in order to send and receive information. Such connectivity is typically provided wirelessly, which can be provided by a number of wireless standards including but not limited to wireless M-Bus, DLMS/COSEM, NB-IoT, LTE-M, LORAWAN, Zigbee, Wi-Fi, 2G, 3G, 4G or 5G standards.

NB-IoT and LTE-M are defined as particular device categories of the 4G/LTE standard, and therefore products implementing these standards will use a subset of the functionality of the whole 4G/LTE standard; we explore some of these issues below. Likewise, WiFi is a generic term for a series of standards that are upgraded and updated from time to time to support a range of capabilities, where (relatively) simple machine-type IoT devices are unlikely to utilise the complete range of capabilities provided in the full WiFi standard.

The smart metering industry has historically widely used the wireless M-Bus standard for connectivity, where there are seemingly few patent licensing issues. Wireless M-Bus is less expensive to implement and provides an existing alternative to 4G or 5G standards, and therefore the value of 4G/5G connectivity needs to be considered in that context.

Wireless M-Bus and most other standards for metering do not have industry patent licensing issues, but there is one area where there are major issues and that is particularly Wi-Fi and 3G/4G/5G standards. The global SEP licensing ecosystem for wireless standards in its current form does not work in a balanced way and no longer supports competition and innovation and a level playing field. In the authors views, the current wireless SEP ecosystem, and the way it is abused by a few SEP holders, is opaque, unbalanced and inhibits competition, innovation and market entry.

The current practice of discrimination against SMEs and smaller companies, and the way the current SEP licensing system is being abused, will likely delay the adoption of green energy and climate change solutions, will lead to excessive pricing for smart meters which will drive up costs for consumers, and will inhibit innovation as companies will look to alternative solutions that are less expensive and have less financial and legal risk. These issues are not limited to the smart meter industry and indeed there are other IoT verticals such as EV charging that have become targets for licensing demands.

For smart meter manufacturers and sellers, as well as energy companies and grid operators, there are a number of important issues to address given the complexity and uncertainty of SEP licensing, some of which are addressed in this article. These include uncertain total exposure to licensing and royalty demands; potential indemnification claims from customers; uncertain identification of potential licensors (licensors may include non-practicing entities (NPEs) as well as original patent owners); complexity and costs involved in negotiating with many potential licensors, including costs to assess their claims; and the threat of injunctions. We deal with some of these in more detail below.

PROBLEMS WITH SEP LICENSING

In the authors views the SEP ecosystem for ETSI standards such as 3G, 4G and 5G is being abused by a few SEP holders contrary to how the broader industry envisaged the system would operate when the ETSI IPR Policy was adopted in November 1994[1].

The abuse of the SEP licensing system for ETSI and IEEE standards manifests itself in a number of ways, including but not limited to:

a) Refusals to license all component suppliers in the value chain

Whereas many SEP owners used to license chipset suppliers and module suppliers, there is currently a concerted practice where some SEP holders refuse to license those companies that actively want a license to SEPs which creates many issues in the supply chain. In a normal supply chain a buyer of products or components will expect their suppliers to supply a product which has the intellectual property rights licensed and paid for. In this new world, many component suppliers cannot get the patent licenses because SEP holders refuse to license them. Whereas smart meter manufacturers buying connectivity components should expect their suppliers to have the patent rights, they will almost certainly not have them, and that therefore leaves the smart meter manufacturer exposed to patent infringement claims. It also leaves them exposed to indemnity claims from their customers if the SEP holders decide to sue the manufacturer's customers.

The current issues mean that companies buying or selling products using standards will have to carefully consider whether to exclude warranties and indemnities for SEP claims in their contracts. This is unsatisfactory as it is not the way business is normally conducted, and it creates risk uncertainty for multiple companies in the supply chain.

b) Discriminatory licensing

Discriminatory licensing manifests itself in a practice where some SEP holders refuse to grant licenses to certain companies in the supply chain.

It also happens when, if they do grant licenses, they secretly grant licenses at significantly different rates to different sized companies, notwithstanding that licenses should be available on non-discriminatory terms. A UK Court has recently found the licensing practices of one SEP holder to be discriminating against smaller licensees[2].

Some SEP holders have been known to misrepresent the true position to prospective licensees to induce them to enter into agreements on non FRAND terms.

c) Seeking excessive and non-FRAND licensing fees and royalties

The reasonableness of FRAND terms must be considered in the context of the "enhanced market opportunities which standardisation [of the SEP owner's] technologies might bring" and in view of the "greatly increased market" for licensing attributable to standardisation[3]. The test to be applied to royalty rates is that they should represent a balance between the need for the owner of an SEP to obtain a fair return on his investment and the enhanced market opportunities created by standardisation.

In other words, royalty rates, although they may have some connection to normal commercial rates, should be reduced because of the enhanced economic power conferred by the Standard. Put simply, the possession of a SEP should not be a passport to windfall profits.

d) Excessive cumulative fees

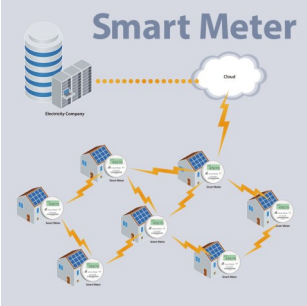
Despite marketing claims of many SEP holders, there is no 'one-stop shop' where a company can get a single license to all patents necessary for one or all of the standards, and therefore many SEP holders seek to charge the maximum they can get away with, using 'FRAND' as a front to try and claim some legitimacy, without taking into account their share of the standard. This means that the rates that are cumulatively charged by SEP holders become excessive. For example, if there were 50 SEP holders and each SEP holder charged 2% or 3% % of the selling price of a component, then the cumulative royalties would be many multiples of the selling price of the component.

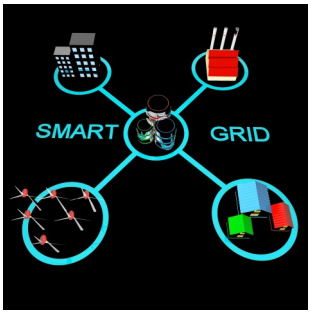
There can also be multiple claims for a product using different standards, so for example, a smart meter might have Wi-Fi functionality as well as 3G and 4G functionality to provide alternative options for connectivity. Such options are provided to ease deployment of the smart meters, by giving installers flexibility depending on the local connectivity solutions. It is never the intention that multiple connections will be active simultaneously. Some SEP holders will claim the same fees for dual connectivity products as for single connectivity products and, in addition, seek further fees for the second connectivity solution. Not only that, but they may also seek to claim some patents are essential to multiple standards that are in the product, and so they will try and only license limited fields of use, thereby "double-dipping" – charging license fees multiple times for the same patent in the same product.

e) Lack of transparency on SEPs

There are hundreds of companies claiming to have SEPs to Wi-Fi, 3G, 4G and 5G standards, and there are tens of thousands of patents claimed to be essential to those standards. However, there is no definitive source of information on those companies and the SEPs. Some standards setting bodies such as ETSI maintain publicly available data on SEPs that have been volunteered by SEP holders, but they have not been independently checked or reviewed. Other standards bodies, such as the IEEE SA (responsible for Wi-Fi) do little to capture such information. The lack of such information means the true number of SEPs is unknown, and even where a SEP holder or patent pool publishes lists of patents it is difficult to determine what percentage this might be of the overall landscape. There are few independent experts in this field, and so the analysis is difficult, uncertain, time consuming and hence expensive.

Since SEP analysis is often related to licence negotiation or litigation it is also typically confidential and hence not made public. Therefore, SEP analysis is often duplicated time and time again for the same patent portfolio asserted against different licensees.





f) Gaming the standard setting system

Many claimed SEPs, if they are not invalid, are often tiny incremental details that do not add substantively to the technology, but they do potentially read on the standard; others are optional features; others are simple alternatives, for example choosing option A over option B because a company in the standards setting process has a patent over option A.

Some SEPs are limited to specific feature sets found only in certain device types: enhanced mobility, massive MIMO antennas, advanced media streaming are headline capabilities for consumer devices, but may not be necessary for IoT or M2M installations.

Some SEP holders game the system by bundling their portfolio into a single offering, which includes options, and features that may not be deployed in all devices.

Some SEP holders claim multiple individual fees for using the same patents in the same products for the same functionality (eg audio and voice codecs), but where the functionality complies with different standards.

Some SEP holders game the system by dividing up portfolios of patents to extricate higher excessive fees, also known as 'portfolio fragmentation'; for example a patent owner A might have 100 patents and charge 1% of the sales price of a component; it then might sell 15 patents to company B (likely to be a so-called non-practicing entity – NPE – that seeks only to monetise the patent assets). Company A still charges 1% (for 85 patents), but company B now wants 1% as well. So a patent portfolio of 100 patents that is 'worth' a royalty of 1% suddenly becomes 'worth' 2% when nothing has changed apart from the ownership of the patents.

g) Seeking injunctions to demand excessive and non-FRAND licensing fees

Many SEP holders, and particularly NPEs, seek injunctions and Customs seizures, often without warning, ostensibly to restrain patent infringement for the purposes of maintaining a monopoly, but with the aim to force companies to pay higher fees than would be payable as a damages or FRAND award.

With hundreds of SEP owners and NPEs and with a landscape of tens of thousands of patents, the risk of a product injunction from any one single SEP is unreasonable. For SEPs, damages should always be an adequate remedy.

In summary, the current SEP licensing ecosystem, and particularly for ETSI/3GPP standards such as 3G, 4G and 5G, is not working in the way that it was originally intended when the ETSI IPR Policy was adopted and implemented in 1994. These issues have been played out in the telecoms sector for more than two decades. In the early 2000s the so-called "Smart-phone patent wars" made headline news as major consumer device companies battled over SEPs. As communications and connectivity have increasingly commoditised and converged with many other sectors these issues are no longer limited to the telecoms sector, or simply to mobile phones. Over the last decade the automotive sector has had to deal with SEP licensing, and even large automotive OEMs have struggled to find their way. Now many of these SEP issues and problems have been raised by companies in the energy industry in Europe, identifying them as a growing challenge for European smart energy delivery [4].

In that context, we try in this article to bring together some of the current claims for SEPs that may be relevant to smart meters, for smart meter manufacturers and operators, and to look at some of the areas to explore further when considering the costs of market entry and product pricing.

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POTENTIAL SEP CLAIMS

In this section we look at some of the current claims relating to:

(a) 3G/4G (WCDMA/LTE) standards;

(b) 5G and 5G Redcap;

(b) WI-Fi; and,

(c) Zigbee

(A) 3G/4G (WCDMA/LTE) STANDARDS

As previously said, there are hundreds of companies claiming to have patents that are essential to the 3G and 4G standards; most do not seek to monetise and seek royalties for their patents, preferring to use them for cross-licensing purposes, but there are a few that do seek to do so.

This summary note addresses some of the companies making claims in the smart meter market for 3G and 4G standards, but it is by no means an exhaustive list.

In relation to the potential costs licensing of standards essential patents, there is a lack of transparency on the costs of patent licensing as most SEP holders try to keep their 'true' rates secret, and do not publish their true or real licensing rates. Many will only disclose their 'headline' licensing rates under a non-disclosure agreement or when compelled to disclose them by a Court or competition authority, although in a recent UK Court case the Judge said he had serious concerns that where a group of SEP owners collectively arrange – using court processes as necessary – to keep market rates (which is what FRAND rates are or ought to be) secret, in order to leverage their own negotiating position, an infringement of the Chapter I prohibition under the Competitions Act 1988 may arise[5].

The 'announced' rates of SEP owners are not necessarily the 'true' or 'real' licensing rates as many SEP holders will grant preferential and discriminatory rates to certain companies. This allows SEP holders to create an unfair and opaque licensing system which enables SEP holders to abuse their FRAND obligations, and to not grant licenses on the same (or even similar) terms to all companies that want the same license[6].

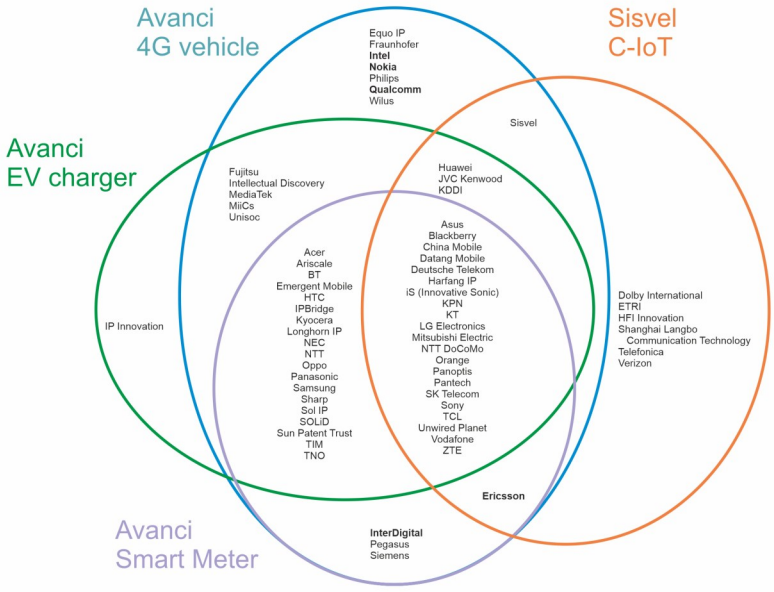
There are only a few companies that have published their claimed rates for alleged SEPs that may be relevant in the EV smart meter space, but it is useful to look at two programmes/pools in particular, namely the Avanci Smart Meter pool and the Sisvel C-IoT pool.

(i) AVANCI

A group of companies have collectively agreed through a company called Avanci to license their claimed 3G and 4G SEPs for smart meter manufacturers and grid operators; Avanci is seeking to charge smart meter manufacturers and grid operators (GOs) $3.00 for smart meters that implement both the 3G and 4G standard, and $2.00 for smart meters that implement only the 3G standard. Some points to note include these:

- The license under the Avanci Smart Meter programme is stated to be for all of the 3G and 4G SEPs represented to be essential and currently owned by the 44 participating licensors, but may not include all of the SEPs that had been owned by the SEP holder if they have disposed of any SEPs before the date of the license;
- The license is for all SEPs for the 3G and 4G standard but smart meters will not need or use all of the functionalities of 3G or 4G standard (e.g., voice), and the products may be limited to the subsets necessary for NB-IoT or LTE-M; many networks are shutting off their 3G networks and so it is unlikely that companies will need to take a license to the 3G patents, save perhaps for past use;
- Smart meter manufacturers will need to review carefully what components they are buying and what standards they are using, and whether they need the full suite of 3G and 4G functionality in their products; companies cannot be forced to take a license to patents they don't use
- There are about 5,740 families of patents that are claimed to be essential to the 4G standard (the 4G landscape), and about 3,000 families that are claimed to be essential to the 3G standard (the 3G landscape);
- Avanci list 44 licensors on their website as being licensors under the Smart Meter programme and those 44 companies have about 52.49% of the 4G landscape (see Table 3 below) [October 2024 data];
- Importantly, the Avanci Smart Meter programme (in purple) does not include several companies that license their SEPs for cars through the Avanci Automotive programme such as Nokia, Qualcomm and Huawei; so smart meter manufacturers and grid operators need to be aware that there may be many other additional claims being made by those companies;
- Smart meter manufacturers and grid operators buying products or components with chipsets from Qualcomm, Mediatek or Huawei should explore with their suppliers whether there are any SEP licenses included within the chipset price, and/or any licenses granted to any SEPs of members of the Avanci Smart Meter programme passed through via cross-licensing or covenants not to sue;
- The Avanci Smart Meter programme does not include many of the larger SEP holders such as Cisco, Google, Texas Instruments and Apple that don't seek to monetise their SEPs;
- Although there are stated to be 44 licensors in the Avanci smart meter programme (April 2025), many of the licensors acquired their alleged SEPs from other SEP holders, as part of a process of fragmentation of their portfolios to drive up licensing costs, so the actual number of licensees is not relevant; the relevant question is how many SEPs the programme licenses, and what proportion of the entire LTE/NB-IoT/LTE-M SEP landscape they can grant licenses to, and Avanci don't publish that information;

TABLE 1 – Members in the Avanci pool for Cars, the Avanci Smart Meter pool and the Sisvel C-IoT pool (and the Avanci EV Charger pool)



Source :Cubicibuc

- Under the Automotive programme, where it licenses approximately 81.5% of the LTE SEP landscape, Avanci seek to charge a license fee of US$20.00 to car companies (OEMs) for using the 3G and 4G standard for each vehicle; car prices will range from approximately $15,000 to say $200,000 and there is a fixed price for the 3G/4G SEPs per vehicle, whereas smart meters will range in price from tens of dollars to a few hundred dollars;

- On the face of it, given that the pricing for 3G only is $2.00, the enhancement to add 4G seems to price the 4G element at $1.00 per smart meter unit;

- Avanci have not publicly clarified how they calculate the smart meter royalty. Assuming 3G patents will not be used as 3G networks sunset and are turned off, it is not clear how the rates have been calculated given that the 3G/4G vehicle charge is $20 per vehicle for approximately 81.59% of the LTE SEP landscape and yet Avanci claim $3.00 for approximately 52.49% of the same landscape;

- Whilst there are currently 2 licensees under the smart meter programme (April 2025), there has not yet been broad market take-up of the programme given the hundreds, if not thousands, of companies that are, and have been, buying, making, selling and using smart meters;

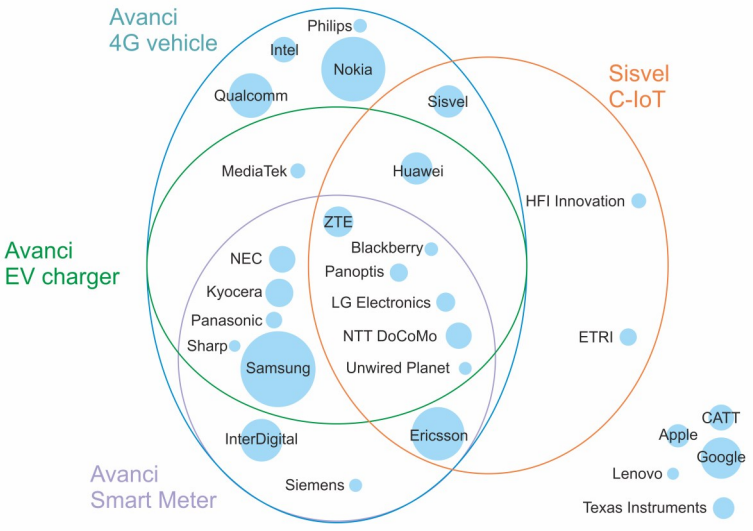
- The Avanci pool license programme does not provide a license for IEEE SA Wi-Fi standards, and so users of smart meters may be subject to further claims from the same companies that are members of Avanci for having Wi-Fi functionality as well as cellular functionality in smart meters; licensors include companies like Huawei, who are involved in a major dispute with Netgear in the US in relation to Wi-Fi claimed SEPs and standardisation in IEEE[7]. Huawei and Mediatek are in litigation following Huawei's request that Mediatek take a license to Huawei's 4G and 5G SEPs[8];

- There is no announced rate for 5G functionality for smart meters, and the lack of transparency on pricing and the licensing model is causing smart meter companies to delay exploring development of new products with 5G (or 5G Redcap) functionality;

- Several of the licensors in the Avanci smart meter programme are also seeking royalties for their LTE-M and NB-IoT patents, which are part of the LTE standard. Their LTE-M and NB-IoT patents are sought to be licensed by Sisvel[9] which is discussed further below. But for a 4G smart meter sold for $100, the fee claimed from Sisvel would be $2.00 per unit, and the fee claimed from Avanci would be $3.00 per unit, making a combined Sisvel/Avanci fee claimed of $5.00 per unit;

- Approximately 19.5% of the LTE landscape is licensed under both the Avanci pool and the Sisvel C-IoT pool, so great care must be taken to ensure there is no 'double-dipping' (i.e., SEP holders being paid twice for the same patent in different pools).

TABLE 2 – Larger holders of alleged SEPs in the Avanci pool for Cars, the Avanci Smart Meter pool and the Sisvel C-IoT pool (and the EV charger pool), with comparative sizes of portfolios.



* Major patent holders - more than 25 patent families

Source: Cubicibuc (Oct 24 data)

TABLE 3– LTE LANDSCAPE AND THE AVANCI SMART METER POOL

Avanci Auto Programme members	Share of LTE landscape	Member of Avanci Smart Meter pool?	Avanci Smart Meter member share of LTE landscape	Member of Sisvel C-IoT pool?	Sisvel C-IoT member share of land-scape	Member of Avanci EV Charger pool?	Avanci EV Charger mem-ber share of landscape
Samsung	19.23%	Y	19.23%			Y	19.23%
Nokia	13.95%						
Ericsson	9.50%	Y	9.50%	Y	9.50%		
Qualcomm	6.65%						
InterDigital	6.06%	Y	6.06%				
Huawei	3.45%			Y	3.45%	Y	3.45%
ZTE	3.12%	Y	3.12%	Y	3.12%	Y	3.12%
Kyocera	2.66%	Y	2.66%			Y	2.66%
NEC	2.36%	Y	2.36%			Y	2.36%
NTT Docomo	2.31%	Y	2.31%	Y	2.31%	Y	2.31%
Intel	2.19%						
PanOptis	1.68%	Y	1.68%	Y	1.68%	Y	1.68%
LG Electronics	1.23%	Y	1.23%	Y	1.23%	Y	1.23%
Panasonic	0.93%	Y	0.93%			Y	0.93%
Alcatel Lucent (Nokia)	0.91%						
Innovative Sonic	0.77%	Y	0.77%	Y	0.77%	Y	0.77%
Mediatek	0.75%					Y	0.75%
Blackberry	0.63%	Y	0.63%	Y	0.63%	Y	0.63%
Philips	0.63%						
Siemens	0.58%	Y	0.58%				
Sharp	0.46%	Y	0.46%			Y	0.46%
IP Bridge	0.40%	Y	0.40%			Y	0.40%
Sisvel/3G Licens-	0.35%						
Sony	0.26%	Y	0.26%	Y	0.26%	Y	0.26%
Others (< 10 patents)	0.54%	Y	0.32%	Y	0.40%	Y	0.33%
TOTAL Pool member	**81.59%**		**52.49%**		**23.35%**		**40.57%**
Others (Non-Avanci)	18.41%		47.51%		76.65%		59.43%
Total	**100.00%**		**100.00%**		**100.00%**		**100.00%**

Source: Cubicibuc (Oct 24 data)

(ii) SISVEL C-IOT POOL – (NB-IOT AND LTE-M STANDARDS)

Sisvel's Cellular IoT pool offers patents covering the LTE-M and NB-IoT standards, which are subsets of the LTE standard.

According to Sisvel's terms[9] the Sisvel Cellular IoT programme is stated to offer a licence to all of the LTE-M and NB-IoT standard essential patents (SEPs) held by the Licensors in the pool.

The SEP holders in the Sisvel C-IoT pool have approximately 23.35% of the 4G SEP landscape (see Table 3), but we have not yet carried out an analysis of the patents that are claimed to be essential to LTE-M or NB-IoT.

There are several licensors in the Sisvel pool that are also licensors in the Avanci pool and so the pricing and scope of both licenses need to be compared and considered. The amounts receivable by those SEP holders under each pool/ programme will be different depending on whether a company takes a Sisvel pool license or an Avanci license, and so a question arises as to whether that is FRAND.

As discussed earlier, approximately 19.5% of the LTE landscape is licensed under both the Avanci pool and the Sisvel C-IoT pool, so great care must be taken to ensure there is no 'double-dipping' (i.e., SEP holders being paid twice for the same patent in different pools). A question arises as to whether the 'double-dipping' element is taken off the Sisvel fee or the Avanci fee.

Great care must therefore be taken by smart meter companies seeking to take a license to SEPs to ensure that they are getting the license rights they expect to be getting, from all SEP holders and licensors, to sell their products.

Sisvel current published rates under the Cellular IoT pool are as follows:

NB-IoT	
- selling price of $6 or less	US$0.08
- selling price of $6 to $20	US$0.35
- selling price over $20	US$0.66
LTE-M*	
Smart Sensor Devices	
- Selling price of US$6 or less	US$ 0.08
- Selling price of US$6-US$20	US$ 0.35
- Selling price of US$20-US$130	US$ 1.33
Smart Utility Metering Devices	US$ 2.00

*The LTE-M royalty rate also applies to multimode devices featuring both LTE-M and NB-IoT standard data connectivity.

Thus for a 4G smart utility meter sold for $100, the fee currently claimed from Sisvel would be $2.00 per unit, and the fee claimed from Avanci would be $3.00 per unit, making a combined fee claimed of $5.00 per unit (subject to 'double-dipping' deductions).

Sisvel have not announced whether they have any smart meter licensees under this pool, as far as we are aware.

In May 2024 Nordic Semiconductor and Sisvel announced that licenses to the SEPs in the Cellular IoT pool can be obtained through Nordic Semiconductor when companies buy Nordic Semiconductor products using LTE-M or NB-IoT standards[10]. There has been no pricing announced for the Nordic Semi-Sisvel license, but this is appears to be a similar arrangement to the one that was announced in January 2022 whereby licenses for Nokia's 4G LTE patents can be obtained from Nordic Semiconductor when buying their products[11].

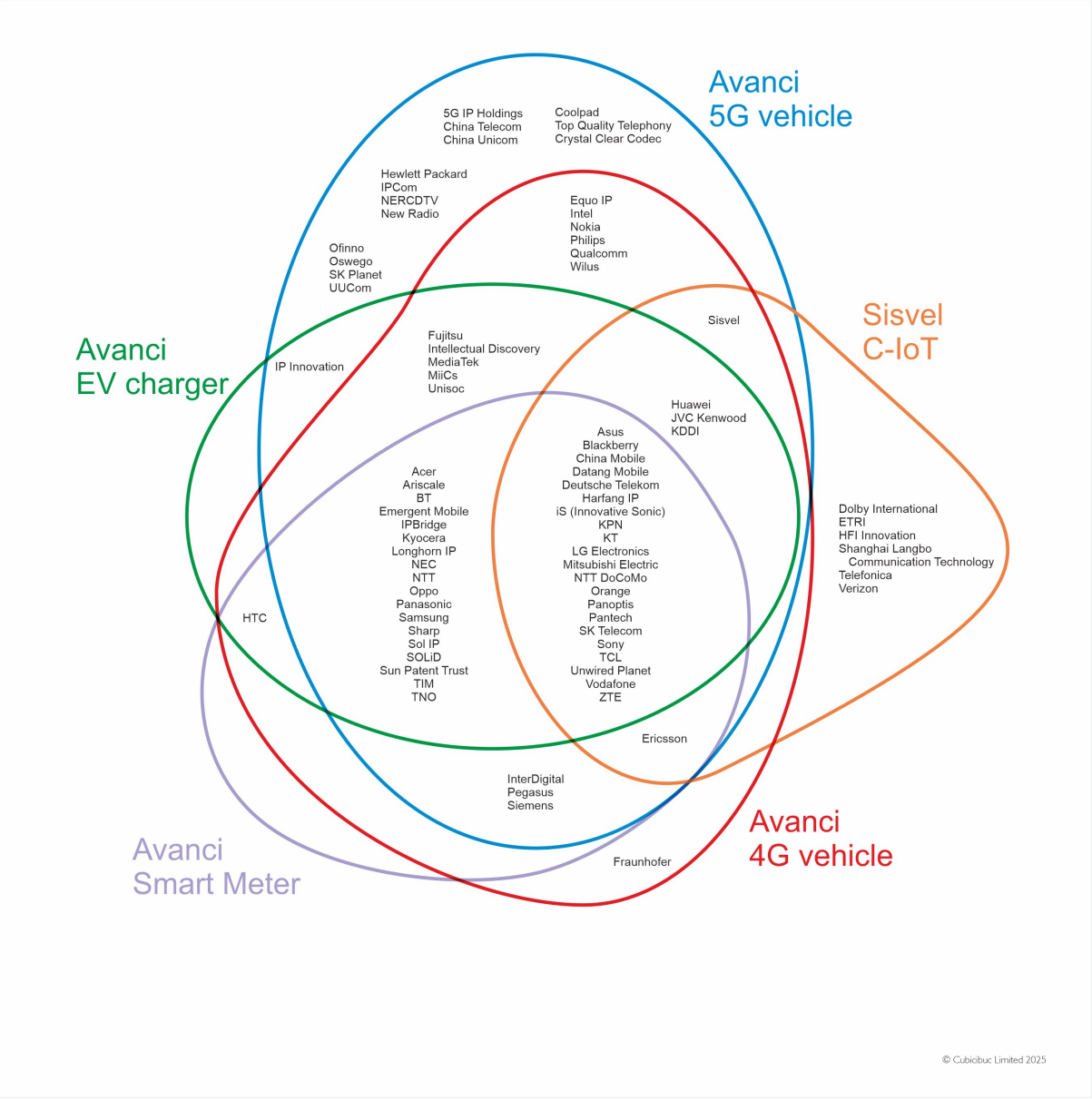
Source :Cubicibuc

(b) 5G and 5G Redcap

The next generation of cellular standards is 5G. 5G Reduced Capability (RedCap), also known as 5G NR-Light, is a variant of 5G designed specifically for IoT devices such as smart meters that don't need the full performance of traditional 5G; it aims to offer cost-effective and energy-efficient connectivity, making 5G more accessible for a wider range of IoT applications. However, 5G and 5G Redcap is equally, if not more, complex than 4G/LTE from an SEP licensing perspective.

Table 4 below is an outline of the current interplay between the members of the Avanci 4G auto pool, the Avanci 5G auto pool, the 4G smart meter and EV charger pools, and the Sisvel C-IoT.

5G and 5G Redcap SEP licensing proposals have not yet been announced by Avanci or Sisvel for smart meters or EV chargers. Given the lack of clarity for the ultimate costs for 5G SEP licensing, and the threat of injunctions, several companies are not developing 5G products, which is impacting innovation and delaying the adoption and use of the 5G standard in connected products.



Source :Cubicibuc

(c) WI-FI Standard

Companies seeking royalties for use of allegedly essential Wi-Fi patents include the following companies:

(a) Wi-Fi (Interdigital)[13]

Interdigital claim a rate of US$0.05 per unit for Wi-Fi enabled products; this would be on top of the amounts claimed through Avanci if there were multi mode products (eg WiFi plus 4G/LTE).

Further, while Wi-Fi is a separate standard, developed by a separate standards organisation to 4G/LTE, there are common technical elements, and hence there may be SEPs in common between the two technologies.

(b) WiFi (Sisvel WiFi pool one)[14]

Sisvel has a patent pool for some patents alleged to be essential to the WiFi standard (IEEE 802.11ax) and patent owners include Philips, Mediatek, Huawei (although Huawei announced in 2022 that it has granted licenses for its SEPs to Nordic Semiconductor and the rates are not publicly announced[15]) and others.

The Sisvel Wi-Fi 6 license rate is $0.60 per unit;

Philips, Huawei and Mediatek are also members of Avanci;

Other claims may also be made for earlier versions of Wi-Fi, which would make the per unit claimed rate an amount of $0.90.

(c) Wi-Fi (Sisvel Wi-Fi pool two)[16]

Another second Sisvel Wi-Fi pool (with different licensors to their first pool), that claims a royalty rate for EUR 0.30 per unit for earlier versions of the Wi-Fi Standard.

Sisvel benchmark against other claimed Wi-Fi rates such as:

i. AT&T 802.11n and ac Patent Licensing Program:

   1. Consumer Electronics: USD 0.12 per unit

   2. Commercial Networking: USD 0.27 per unit

ii. Philips TV & STB program (incl. Wi-Fi-n)

   1. EU: EUR 0.13 per unit

   2. US: USD 0.05 per unit

iii Via Licensing (Dolby) 802.11 (a-j) (Electronics and Telecommunications Research Institute (ETRI) LG Electronics, Inc. Nippon Telegraph and Telephone Corporation)

   1. 1 to 500,000: USD 0.55 per unit

   2. 500,001 to 1,000,000: USD 0.50 per unit

   3. 1,000,001 to 5,000,000: USD0.45 per unit

   4. 5,000,001 to 10,000,000: USD 0.30 per unit

iv. Vectis Wi-Fi Licensing Program Wi-Fi One, LLC (patents originally filed by Ericsson and Panasonic Corporation, and then sold as part of their portfolio fragmentation strategy) for all essential patents:

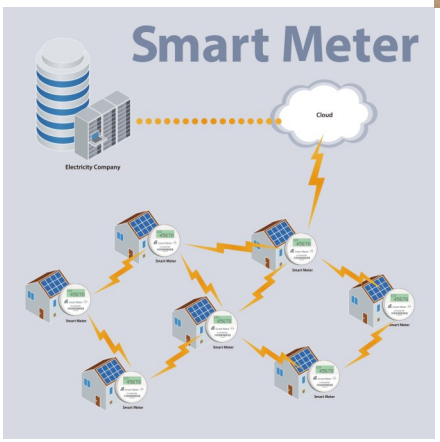
   USD 0.17 per unit

(d) Zigbee

Companies that may have SEPs relating to Zigbee include Qualcomm, Convida, Intel, Nokia, Samsung, LGE, Ericsson, Sun Patent Trust, Philips and InterDigital.

We are not aware of any pools relating to Zigbee, and we have not prepared a landscape analysis for SEPs and the Zigbee standard.

As discussed earlier, some SEP holders will claim the same fees for dual standard connectivity products as for single standard connectivity products.



Source :Cubicibuc

POLICY ISSUES

Policy makers need to understand the issues at stake in the smart metering market. The meter industry delivers essential functionality to consumers.

The smart meter industry tenders and delivers to public service companies, and excessive SEP charging directly impacts consumers with rising energy bills.

The UK Competition and Market Authority (UK CMA) published guidance in 2021 on sustainability agreements and competition law[19] and stated that:

When setting up a new standard, businesses, trade associations and/or standardisation organisations should follow these steps to comply with competition law:

* allow stakeholders to inform themselves effectively of upcoming, on-going and finalised standardisation work in good time at each stage of the development standard – for example, through the publication of regular updates in dedicated journals

* guarantee that all competitors in the markets affected by the standard can participate in the standard-setting process and join the agreement.

* ensure access to the standard is on fair, reasonable and non-discriminatory terms for all businesses which comply with it

* if the standard-setting involves intellectual property rights (IPR), participants must disclose in good faith their IPR that might be essential to the implementation of the standard. They must also offer to licence their essential IPR to all third parties on fair, reasonable and non-discriminatory terms. This should be provided for in an IPR policy from the standard-setting organisation.

Courts have repeatedly stated that the contract created by clause 6.1 the ETSI IPR policy obliges SEP holders to grant a license of the SEP to any implementer who wants a license on FRAND terms [17].

Despite the clear statements that there must be an offer to license essential IPR (SEPs) to all third parties that want a license on FRAND terms, and despite that being the intent of the ETSI IPR Policy, this is still not happening in practice with existing standards such as 3G and 4G.

From a policy perspective, action must be taken to enable any company that wants a FRAND license to be able to get one, and to create a fair and balanced system for SEP licensing for innovators in the critical smart meter space, and those looking to develop products.

Pools must comply, and be made to comply, with competition laws around the globe and must adhere to the FRAND licensing commitments made by their principals.

A fairer and more balanced system is needed for smart metering, and also for other 'smart' infrastructure that is being explored in countries targeting Net Zero (for example: smart grids, smart cities, and EV charging etc).

Organisations looking to advocate fairer and more transparent SEP licensing include ESMIG, the European association of smart energy solution providers (www.esmig.eu) and the Fair Standards Alliance (www.fair-standards.org).

Helpful SEP licensing guidance can be found in the 2019 CEN-CENELEC Workshop Agreement that published "Core Principles and Approaches for the Licensing of SEPs".[18]

Summary

The above claimed rates are just some examples of the costs that may be claimed for using technical standards. None of these costs take into account the legal fees that will be spent in conducting due diligence and investigating claims that patents are valid, or essential or infringed, or whether the license terms are FRAND terms.

Clearly there are some significant challenges especially for SMEs and small-mid-size companies who may not be aware of the plethora of issues, and legal/commercial risks, that they are getting into simply by innovating in the IoT.

Companies that are buying or selling connected products need to ensure that they are fully aware of all of the risks that come from using connected products.

Buyers need to undertake more due diligence to make sure that their suppliers can tell them which patents they have licenses to, and whether there are any potential claims that may be made directly against the buyer.

Sellers need to carefully consider the scope and extent of any warranties or indemnities they give, the time for claims to be made, and the limitations of liability, as claims may come many years after the products have been sold.

This article was written in May 2025. It was not funded by any third party. It does not contain legal advice and the landscapes and license fees claimed may have changed, and may in the future change. Readers should rely on their own investigations and analysis. We would welcome further information or contributions from readers, and would be happy to review comments.

For further information on these issues please feel free to contact the authors Robert Pocknell and Graham Bell.

Contact details:

Robert Pocknell robert@licensingforstandards.co.uk	Graham Bell graham.bell@cubicibuc.com
N&M Consultancy Limited	Cubicibuc Limited
19 Old Square, Warwick, CV34 4RU England	Cart House 2, Copley Hill Business Park Cambridge, CB22 3GN England

ABOUT N&M AND CUBICIBUC

N&M Consultancy Limited (N&M) is a company registered in England. It was incorporated in 1991, and has advised companies on the licensing of Standards Essential Patents (SEPs) for more than 33 years; during that period, N&M:

- was a member of the European Standards Telecommunications Institute (ETSI) promoting the use of fair, reasonable and non-discriminatory (FRAND) licensing terms and conditions;
- was closely involved in discussions regarding the ETSI Intellectual Property Rights (IPR) policy which culminated in the ETSI IPR Policy adopted in November 1994;
- published the Handbook on the Operation of the ETSI IPR Policy in 1995 following the adoption of the ETSI IPR Policy in November 1994;
- acted as the secretariat for the International Telecommunications Standards Users Group (ITSUG) whose then members included amongst others Marconi PLC, Interdigital, Sony, Sendo, Mitsubishi, Panasonic and Blackberry. ITSUG was established to represent the interests of standards users in the telecommunications sector, and was a member of ETSI;
- has advised many companies, small and large, on SEP licensing issues; and was a founding member in 2015 of the Fair Standards Alliance, an organisation of approximately 50 companies involved in the licensing of standards essential patents, who seek fairer SEP licensing practices; and
- was a contributing participant in the development and approval of the 2019 CEN CENELEC Workshop Agreement that published "Core Principles and Approaches for the Licensing of SEPs".[20]

Cubicibuc was established in 2015 as an independent technical consulting firm specializing in technical and commercial matters relating to Intellectual Property.

Cubicibuc is built on experience from over 20 years' providing technical and commercial IP services to clients in a range of sectors and geographies.

Cubicibuc specialises in issues relating to standards based IPRs, and has published widely on issues of Standards Essential Patents (SEPs), Fair Reasonable and Non-Discriminatory (FRAND) licensing and has been directly involved in a number of international litigations and arbitrations, and complaints to the EU and US competition authorities. We have developed patent landscapes for a number of standards based technologies, including cellular: 3G, LTE and 5G; WLAN such as IEEE 802.11n and .ac; and ITU-T G.8032 and G.709.

We believe good IP management allows business to protect its competitive advantage; to generate returns on R&D investment and to secure investment and finance. To manage IP well business must adopt a combination of commercial, legal and technical expertise – but always with a pragmatic focus to actively manage and exploit the IP in a manner that brings benefits to the business.

We work with businesses ranging from smaller start-ups to mature multinationals; from early stage invention capture through to exploitation and monetisation of IP assets.

Cubicibuc provides expert IP strategy support, patent evaluation, landscaping and expert witness in a range of technologies including telecommunications and consumer electronics, automotive, and semicon.

References:

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[2] Interdigital vs Lenovo https://www.bailii.org/ew/cases/EWHC/Patents/2023/539.html at para 495

[3] EC 1992 Standards Communication https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:1992:0445:FIN:EN:PDF , ¶ 4.3.3 and 4.3.7.

[4] See for example this article at https://www.smart-energy.com/industry-sectors/business/standard-essential-patents-a-growing-challenge-for-eu-smart-energy-delivery/ and 'IP Issues in the Energy Sector' available at https://www.globelawandbusiness.com/storage/files/minis/36-6278fd0c2b3d6.pdf

[5] Optis Cellular vs Apple [2024] EWHC 197 (Ch) at para 33 (ii)

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7 2:24-cv-00824 Central District of California Netgear Inc vs Huawei & Ors (filed 31 Jan 2024)

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[15] https://www.sisvel.com/Wi-Fi/Wi-Fi_Royalty_Rate.pdf

[16] https://www.gov.uk/government/publications/environmental-sustainability-agreements-and-competition-law/sustainability-agreements-and-competition-law

[17] See for example at para 9 of the Judgment of Arnold LJ in Tesla vs Avanci dated 6th March 2025 –2025 EWCA Civ 193

[18] https://2020.standict.eu/sites/default/files/CWA95000.pdf