

# Commercial and economic impacts from IPR policy changes

Summary on a report for Qualcomm Europe Inc.

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# Executive summary

# We report on contentious policy adopted by the IEEE Standards Association in 2015

- Introduction

- We provide an independent assessment of commercial and economic impacts that could result in the telecommunications and related sectors, following recent policy changes adopted by the US based IEEE technical standards body.
- The IEEE changes, as adopted, are highly contentious and represent a significant shift from established 'FRAND' policy, as currently adopted by Europe's ETSI and others, that has served the industry well for many years.

- Our report

- We undertake a detailed review of the IEEE IPR policy changes, developing both qualitative and quantitative assessments of commercial and economic impacts, were the changes to impact European markets and firms.

# Our analyses indicate that, overall, economic harm is likely if the IIEEE policy, or similar, is adopted

- Key issues

- Evidence for ‘patent hold-up’ – the theory of market power brought about by leverage of standards essential patents, and driver towards IIEEE policy revisions – is hard to find.
- IIEEE policy revisions are centred on firmer and restrictive definitions of royalty rates and removal of injunctive relief for patent owners. The legality of these principles has recently been called into question under European competition law.

- Key findings

- With widespread implementation of IIEEE like IPR policy, European GDP levels could be harmed significantly – by at least negative 0.5%, with significant risk of contagion to the wider digital economy – worth around 10% of European GDP.
- In contrast, we expect only modest benefits from any impacts to smartphone prices. In fact, in the medium to long term, harm is likely due to product quality levels being driven downwards by reductions in R&D investment.

# **It is essential that European policy makers are briefed on IPR policy matters, developing appropriate actions**

- Recommendations
  - European policy makers should be aware of the IEEE 2015 IPR policy and its significance.
  - Our independent analyses indicate the potential for significant overall economic harm if IEEE like policy becomes widespread.
  - We recommend that European IPR policy is continued in line with established FRAND principles, with no need to adopt revisions in line with IEEE 2015 IPR policy.

# 1. Background

# Technical standards, intellectual property, and the policy that relates these are critical enablers for Europe's digital industry

- Technical standards are, and have been, essential enablers in the development of modern telecommunications systems, providing both platforms for intense and critical R&D activity and global growth via access to economies of scale and market diffusion. Today's global smartphone industry is worth some €400bn in revenues and this is just a part of the modern digital economy which is estimated to be worth around 10% of global GDP (and growing).
- The pioneering success of mobile telecommunications systems is part of Europe's modern heritage which saw essential involvement from standards bodies, such as ETSI (European Telecommunications Standards Institute), and the ongoing development of fifth generation (5G) telecommunications systems is a matter of crucial concern for many of Europe's most senior policy makers.
- Development of legal protection of intellectual property via established patent processes and policy within standards development organisations (SDOs) is normal procedure in the high technology and telecommunications industries. Where patents are introduced into standards with potentially no possibility for subsequent product implementation without either infringement or legal patent use (i.e. potentially, no technology workaround is feasible in implementations against the standard using the patent), these are referred to as Standards Essential Patents (SEPs).



# **In many markets, ‘FRAND’ policy is well established, and has served the industry for many years**

- The ‘FRAND’ (Fair, Reasonable, and Non-Discriminatory) approach to IPR policy, within technical standards bodies, is well established, and has served the high-technology industry for many years.
  - Adoption of a FRAND approach within standards bodies has typically meant that proponents holding essential intellectual property (IP) via Standards Essential Patents (SEPs) – wherein a published standard cannot be legally developed and adhered to without infringing such property – are required, by the standards body, to declare the IP within the forum within a reasonable time frame and to openly offer licencing terms to interested parties at commercially reasonable rates often set through bilateral and private negotiations.
  - Recourse to the law is an option for parties where such negotiations may fail and the law of a specific jurisdiction may become involved in any instances of unlawful behaviour (such as cartels).

# IEEE 2015 IPR policy brings a number of significant changes, relative to ‘FRAND’

- Summary of amendments, per IEEE 2015 IPR policy:

Key item	Key issues
<b>Firmer definition of licensing rates and on associated terms</b>	<ul style="list-style-type: none"> <li>• Definition of licensing rates is built into policy.</li> <li>• Rates should be determined based on consideration of the smallest saleable patent practicing unit (SSPPU) compliant implementations of the SEP(s).</li> </ul>
<b>Diminished availability of injunctive relief</b>	<ul style="list-style-type: none"> <li>• Any assurance given (via letter of assurance – LOA) for use of SEP(s) under agreed licensing terms shall preclude access to injunctive relief.</li> <li>• Submitters of accepted LOAs shall not seek, nor seek to enforce, injunctions with associated SEP(s), unless an implementer fails, within appropriate deadlines, to accord with adjudicated outcomes that may be defined by courts with appropriate authority.</li> <li>• Essentially, the policy makes it difficult for licensors to seek injunctive relief unless matters have already gone to court and licensees have failed to accord with ensuing outcomes.</li> </ul>
<b>Restricted reciprocity in licensing</b>	<ul style="list-style-type: none"> <li>• Reciprocity in any SEP licensing between licensors and licensees shall be constrained to licensing pertaining to a single technical standard.</li> <li>• Reciprocity in licensing shall pertain only to SEP(s).</li> </ul>
<b>A stricter definition of compliant implementation</b>	<ul style="list-style-type: none"> <li>• A compliant implementation encompasses end products through to components or sub-assemblies that are incorporated into the end product.</li> </ul>

## **2. Purpose and scope of the report**

# Our report is focused on economic assessment of the IEEE 2015 IPR policy

- Where SEPs are invoked, some factions have developed a theory suggesting that tension could result with incidences of market power and imbalance conflicting with the objective of making standards widely available for use.
- We address policy that was implemented in March 2015 by the US based Institute of Electrical and Electronic Engineers (IEEE), which has become known as IEEE-II, following a series of prior revisions, and was driven due to concerns, raised by some, over the ability of existing policy to effectively address such tensions.

# We provide an independent assessment of likely economic impacts for European firms and markets

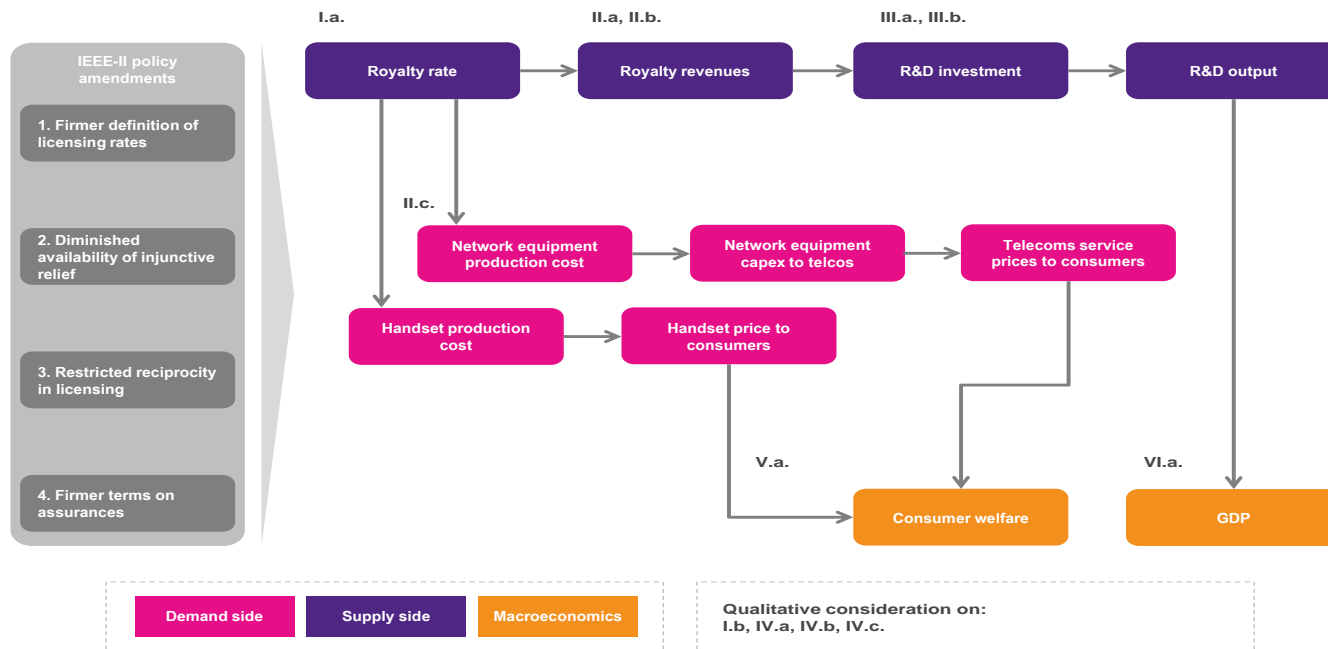
- This report provides an independent assessment of the commercial and economic impacts that could result from important changes in policy associated with Intellectual Property Rights (IPRs) in certain technical standards bodies, as related to research and development (R&D) of commercial products in the telecommunications sector.
- Our purpose is focused on extraction of commercial and economic meaning of the IEEE-II policy changes, against a baseline of FRAND policy as established within ETSI and others and as recently advocated by CEN (The European Committee for Standardisation) and CENELEC (The European Committee for Electrotechnical Standardisation) – two other important standards bodies within Europe.
- The IPR policy field is, by nature, complex and manifold. Our analyses comprise quantitative economic modelling together with deep industry experience and expert judgement in both development of analyses and results.
- Our scope excludes any recommendations towards legal and accounting matters.

# 3. Approach

# Our approach is based on detailed review of the IEEE IPR policy, with quantitative economic modelling across both sector R&D and cost impacts

- We undertake a detailed review of the IEEE IPR policy changes, developing both qualitative and quantitative assessments of commercial and economic impacts, were the changes to impact European markets and firms.

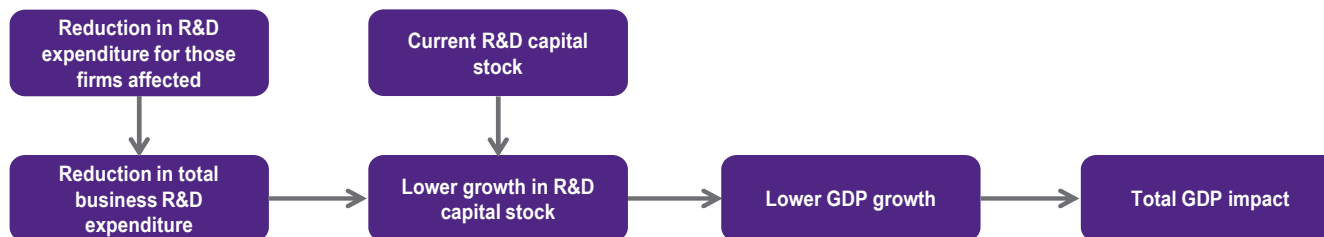
## Overall approach on economic modelling:



# Impact to sector R&D is assessed and linked to economic performance via GDP analysis

- With a focus on Europe, we assess likely impact to R&D investment levels for key digital sectors, linking this to a decline in R&D capital stock, then overall economic productivity and GDP levels.

## Modelling approach for R&D and GDP impact analysis:



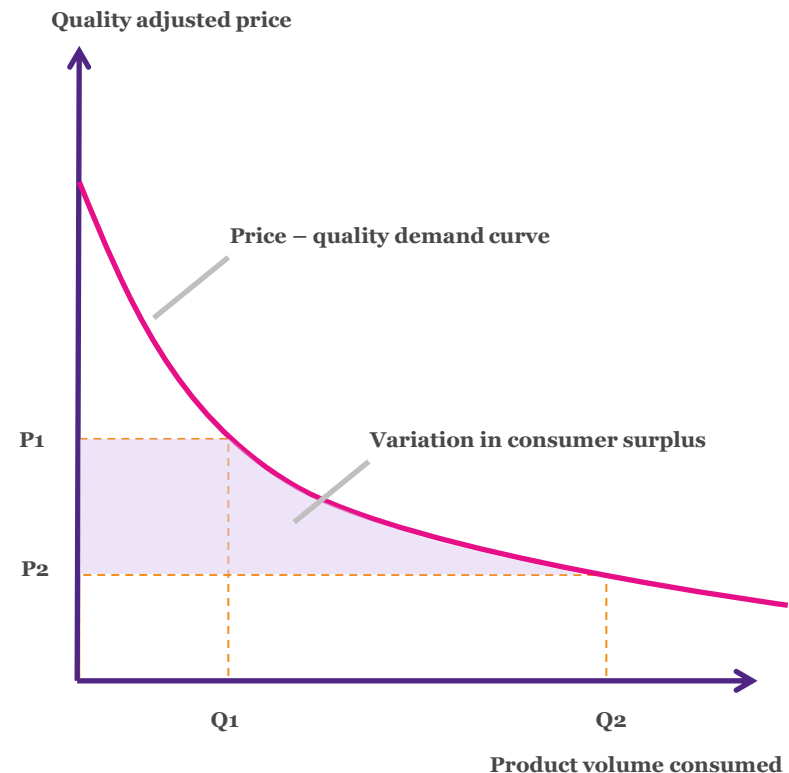


# Impact to device pricing and quality is assessed and linked to economic performance via consumer surplus analysis

- Also focused on Europe, we assess likely impact to device pricing and quality levels, linking this to device volumes and quality adjusted pricing, then consumer surplus.
- We refer to the ‘25% rule<sup>†</sup>’, industry precedent, and empirical evidence on IPR royalty yields from smartphone sales, indicating mean yield levels on FRAND SEPs of 5% or less, noting that it is more appropriate to examine long run profits and sales, since benefits from IPR often accrue over time once licensing terms have been agreed.

<sup>†</sup> The ‘25% rule’ suggests that a licensee pay a royalty rate equivalent to 25 per cent of its expected profits for the product that incorporates the IP at issue.

## Modelling approach for consumer surplus analysis:



## 4. Key findings

# **We estimate, conservatively, that implementation of IIEEE 2015 IPR policy, in Europe, could yield negative impact to GDP of 0.5% in the long run (€465bn at 2016 rates)**

- With IIEEE-II policy or equivalents in place, we estimate that a decline in overall European R&D of 8% could be precipitated, yielding a negative impact to GDP figures of 0.5% in the long run. Such an impact would amount to €465bn (at 2016 rates).
- We believe that this estimate is conservative as it is likely that in addition to reduction in overall R&D investment, diversion of investment could also occur as a result of any actual or perceived devaluation in standards output. With disproportionate decline in standards output, productivity gains associated with standards per se will be lost. We estimate that such effects have the potential to drive a further decline in overall GDP by approximately 1.5 percentage points.
- In addition, the high technology and telecommunications industries are significant enablers to the wider digital economy. Estimates put the worth of this at c. 10% of total GDP (across G-20 countries). Whilst it is unlikely that implementation of IIEEE-II policy or similar would detriment the entire digital economy, it is certainly true that user access to digital platforms is increasingly shifting towards mobile devices and some level of contagion is likely in the economy as a whole.

# **Our analyses on service and device pricing suggest that no material benefits will ensue for consumers, thus providing no offset on negative impacts on GDP**

- Our analysis on smartphone handset price reductions and impact to consumer welfare suggests only relatively modest benefits, if any. When measured in terms of consumer surplus in Europe, these benefits may amount to just €3bn (at 2016 rates, with material impacts evident only over a five year cycle), with no material impacts to telecommunications service pricing. With no pass through on cost benefits to prices, overall negative impact to consumer surplus is likely (taking into account, in all cases, the negative impact on pace of innovation and product quality levels likely to be precipitated by declines in R&D investment levels).
- We conclude, overall, that significant negative impact to national and regional GDP levels is likely with the scale of R&D investment changes that would be precipitated with implementation of IEEE-II like policy in standards bodies, with negligible to no offsetting of this with improvements in consumer welfare.

## **5. About our report**

# About our report

- Our full report is available in the public domain at:

<http://plumconsulting.co.uk/commercial-economic-impacts-ipr-policy-changes/>

We cannot guarantee that we have had sight of all relevant materials that may be in existence and that may be relevant to our purpose. Nevertheless, our review has included rigorous analysis of materials that we have gained access to and that we deem relevant at the time of preparation of this Report; such materials are referenced throughout.

The Report has been prepared by Plum Consulting London LLP ('Plum' or 'Plum Consulting') on behalf of Qualcomm Europe Inc.

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## **6. About Plum Consulting**

# About Plum Consulting

- We are a leading independent consulting firm, focused on the telecommunications, media, technology, and adjacent sectors. We apply extensive industry knowledge, consulting experience, and rigorous analysis to address challenges and opportunities across regulatory, radio spectrum, economic, commercial, and technology domains.
- We support our clients' needs with a range of consulting solutions including regulation and policy, radio spectrum management, applied economics, commercial and technology strategy development and implementation, due diligence and transactions, financial and technical modelling, change and performance improvement, and specialist engineering and technical support.
- Based in London, we are proven and experienced in delivering to diverse needs and approaches globally, including for governments, regulators, service providers, vendors, professional investors, and legal firms.



## **7. Authors and contact details**

# Authors and contact details

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  - **Sam Wood** is a Consultant at Plum with a range of experience, ranging from spectrum valuation to estimating cost of capital. He has worked on issues as diverse as fibre regulation, platform neutrality and interoperability and broadcasting technology, as well as on numerous spectrum valuation projects. He holds a Masters degree in Economics from the University of Warwick.
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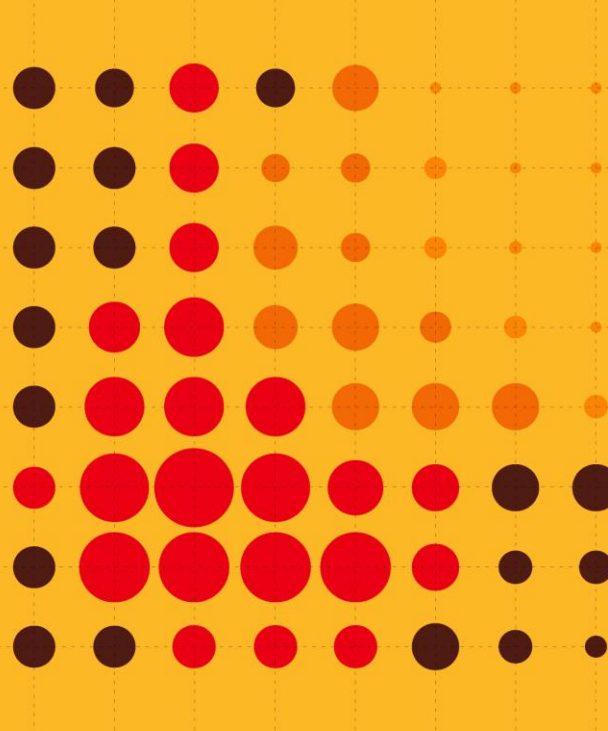
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