IPlytics - Bringing Clarity to the Wireless Charging Patent Landscape

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The Qi Standard Patent Data Challenge

Optional Slides

What is Qi?

Qi wireless charging (**Pronounced as Chee)**, recognized for cable-free convenience, is widely implemented in electronics. The latest Qi 2.0 standard introduces magnetic alignment to enhance charging efficiency, with widespread applications in various industries, furthering wireless charging adoption due to its eco-friendly benefits.

What is Qi Standard?

Qi standard, managed by the Wireless Power Consortium, is a globally recognized standard for wireless charging. It ensures compatibility between different wireless charging devices, promoting a universal charging solution. It's widely adopted in smartphones, accessories, and increasingly in larger devices, contributing to a clutter-free and convenient charging experience.

The wireless charging market potential

- The Qi standard is simplifying the charging experience by eliminating tangled cables and providing a seamless and efficient way to power electronic devices.
- This not only enhances user convenience but also contributes to a clutter-free environment.
- The global wireless charging market was valued at USD 22.17 billion in 2022.
- A commonly reported figure is that 29% of the smart phone users use a wireless charger.

The Qi standard market

- The Qi wireless charging standard was developed by the Wireless Power Consortium (WPC) and first released in 2008.
- Qi is certified for over 9,000 different wireless charging products and widely adopted across smart phones but also smartwatches to electric toothbrushes, furniture, and vehicles and more.
- In 2023, over 1 billion Qi compatible products were sold.

Qi standard standard essential patents (SEPs)

- The Qi standard is subject to thousands of standard essential patents (SEPs).
- The challenge with identifying the Qi patent landscape is that many large Qi patent owners' portfolios are not public since the is no systematic patent declaration database like ETSI.

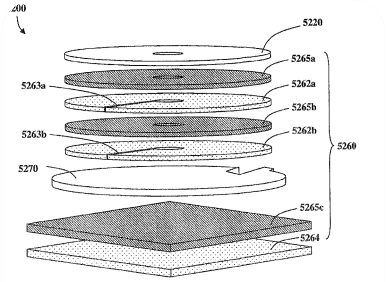


Fig. 5e

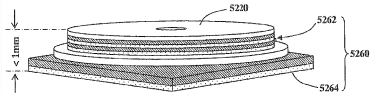


Fig. 5f

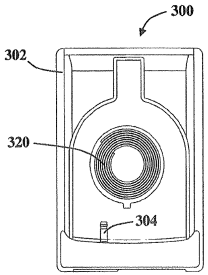


Fig. 1b

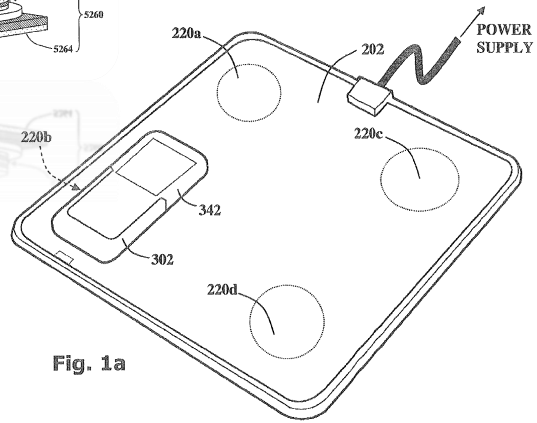
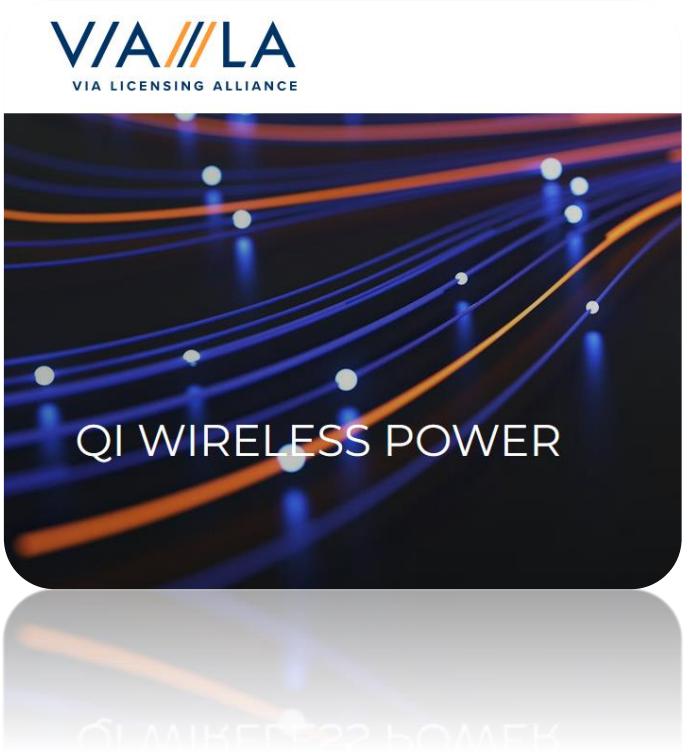


Fig. 1a

Qi patent pool program

- In January 2020, the Via LA patent pool administrator announced a license for patents essential to the Qi standard.
- Qi patent pool members include Convenient Power, GE, Hyundai Mobis, Intel Corporation, Philips, LG Innotek, Panasonic, Robert Bosch and WiTricity.
- Via LA offers an aggregated pool rate between $0.2 to $0.85 cents per Qi standard compliant product.



Qi standard patent data transparency

Via LA patent pool members have publicly listed Qi SEPs on the patent pool website, other companies made declarations on their websites:

Name	Link
Qi pool by Via LA	https://www.via-la.com/licensing/qi-wireless-power/
Phillips	http://www.ip.philips.com/licensing/program/128/wireless-power
Powermat	https://powermat.com/oem-3/ip-licensing-program/

- However, market experts believe that 60-70% Qi of the SEP portfolios are not public!

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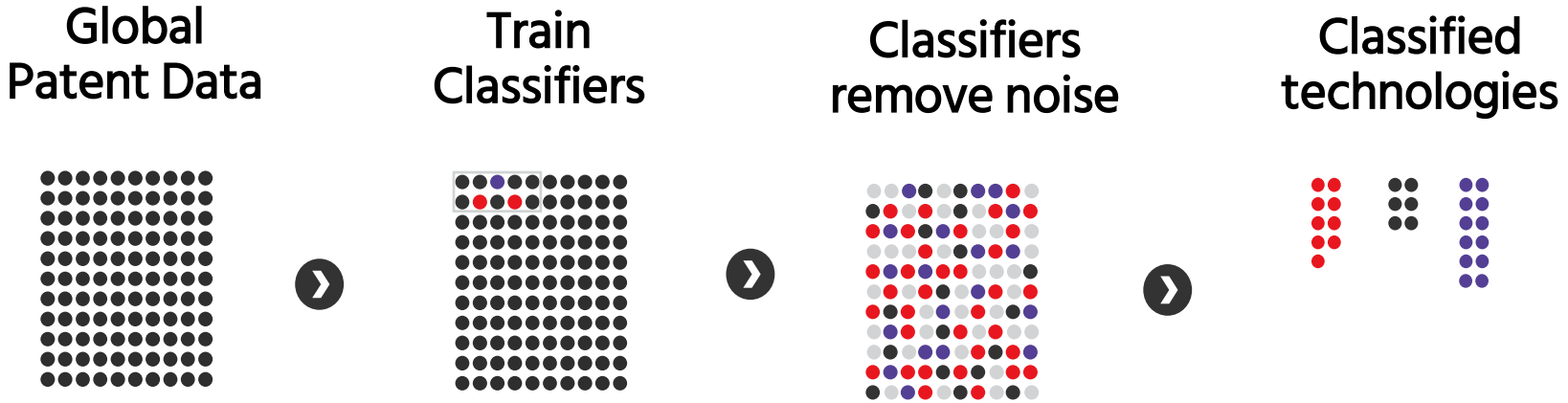
The Qi Standard Patent Identification Approach

Usining supervized ML to identify Qi patents

- The IPlytics data team has utilized **Cipher Certified** (supervised ML algorithm) to identify Qi related patents.
- The **Cipher Certified** algorithm uses true positive and negative training data to build Classifiers with independently verified accuracy.



Iterating the process using true positives and true negatives

True positive training set:

- Publicly known SEPs (patent pool lists)
- Highly relevant patents (based on SME review) as a result of an expert „claim standard text comparison“ in Cipher.

True negative training set:

- Patents related to wireless charging but not to the Qi standard (based on SME review).
- Patents owned by companies with no connection to wireless charging (based on cluster).

Iterating the process using true positives and true negatives

- Cipher uses machine learning to classify patent data to clusters and identify classes in the landscape.
- The screenshot illustrates a Qi standard patent result list from one of the first iterations.

	Samsung Electronics	Canon	LG Electronics	Apple	Qualcomm	LG Innotek	Panasonic	Philips	Energous	Sony	Next 1077	TOTAL
Wireless power, power supply unit, contact power transmission, wireless charging device, power reception device	326	80	152	129	130	96	69	86	84	63	1,818	3,033
Power transmission, wireless power supply, power reception device, power feeding system, wireless charging system	104	142	45	31	11	32	48	19	29	42	1,015	1,518
Wireless charging, wireless power transfer, portable electronic device, power supply, power transmission	102	7	21	37	15	7	16	10	11	8	1,209	1,443
Foreign object, foreign matter detection, power transfer system, object detection, wireless power	2	0	0	2	0	0	1	5	0	0	52	62
Power transfer, inductive power, power transmitter, power receiver, wireless power	0	0	0	5	2	1	0	12	0	0	23	43
Wireless power, power transmitting apparatus, control methods thereof, storage medium, transmission power	4	20	2	0	0	5	0	0	0	0	6	37
Power transfer, wireless power, power receiver, power transmitting unit, power transmitter	0	0	1	0	0	0	0	0	0	0	12	13
TOTAL	538	249	221	204	158	141	134	132	124	113	4,135	6,149

Currently active patent families (granted or pending) by organisation and technology. Help centre article

Data limitations – The Qi patent landscape is not a Qi SEP landscape

- The Qi-related patent landscape includes both verified standard essential patents but also non-SEPs (other words, patents related to the Qi technology but not essential to the Qi standard implementation).
- The Qi-related patent landscape includes 3,557 active and worldwide granted patent families as of January 31st, 2024.

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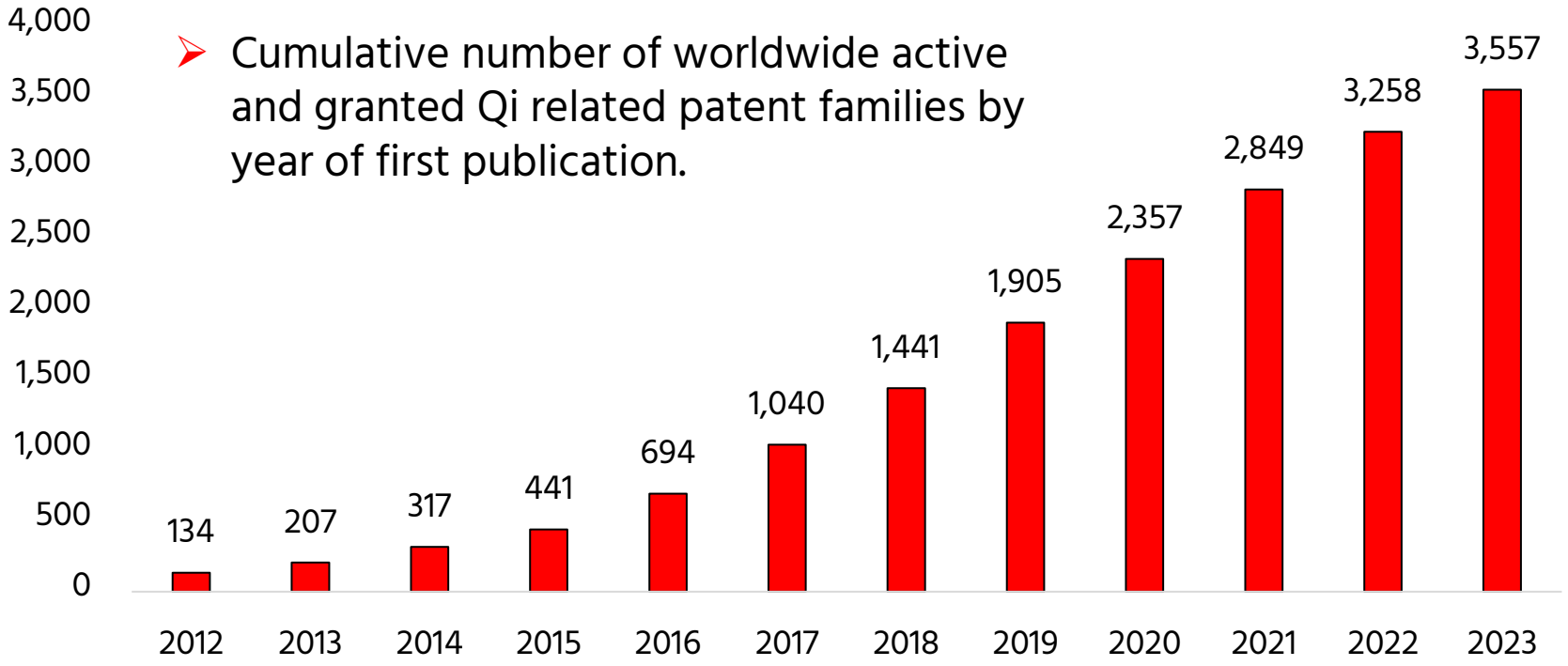
Qi Standard
Patent Data Statistics

Qi related patents over time

- Cumulative number of worldwide active and granted Qi related patent families by year of first publication.

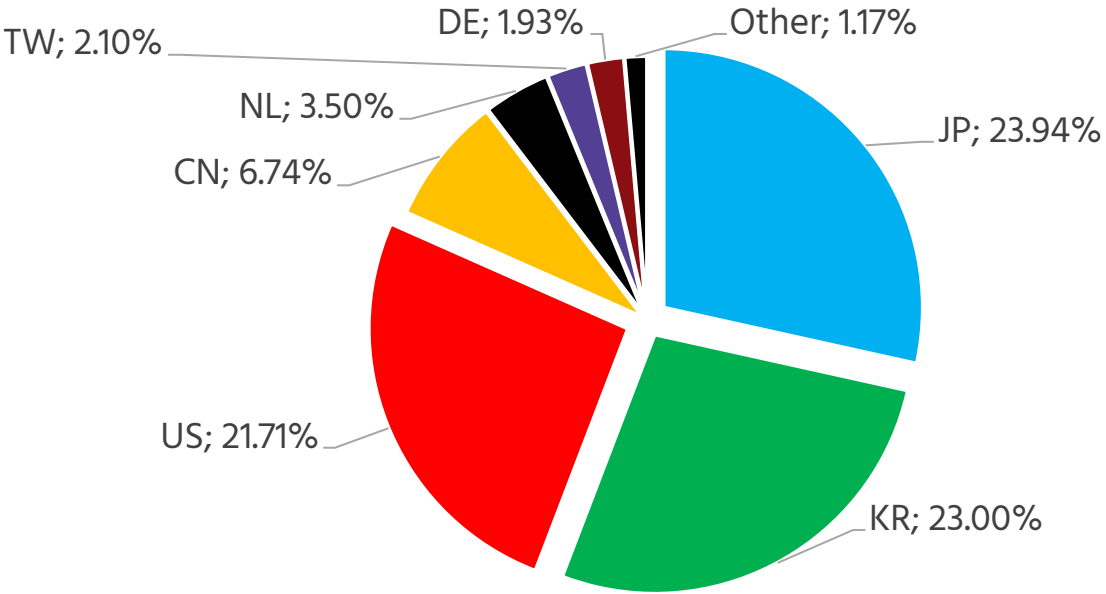


Top 10 Qi patent owners / Qi licensors

Ultimate Owner	HQ	Share of Qi related patent families (active and granted in at least one jurisdiction)	Share of Patent Asset Index Qi related patent families (active and granted in at least one jurisdiction)
Samsung	KR	8.21%	7.75%
Apple	US	4.25%	4.58%
Canon	JP	3.82%	1.78%
LG Electronics	KR	3.46%	3.26%
Panasonic	JP	3.15%	3.17%
Philips	NL	2.73%	10.18%
LG Innotek	KR	2.67%	1.74%
Qualcomm	US	2.47%	7.82%
Sony	JP	2.45%	3.77%
Chemtronics	KR	2.45%	1.43%
GE	US	2.02%	2.55%

Qi patent owner / Qi licensors

- Qi patent owner, by patent family share and by region of HQ

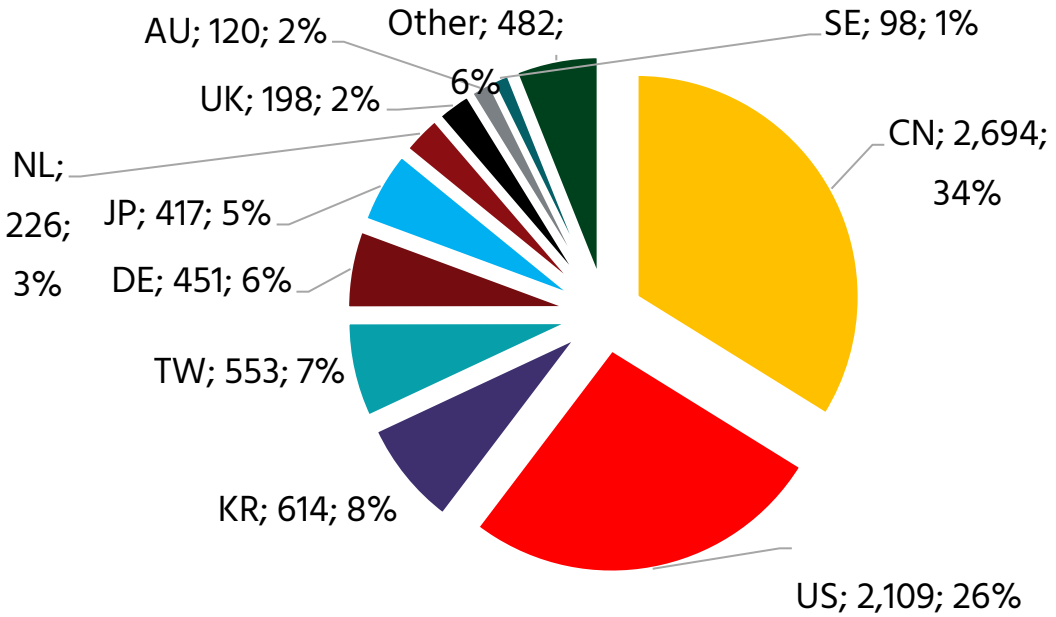


Top 15 Qi compliant product manufacturer / Qi licensees

Manufacturer	HQ	Number of Qi certified products
Samsung Electronics	KR	377
LinkCom	TW	339
iHome	US	163
ELECOM	JP	128
HUAWEI	CN	121
ADAYO	TW	113
ACV GmbH	DE	86
Anker	US	81
mophie	US	77
DNS	RU	70
ZENS	NL	68
ESORUN	CN	66
Sony	JP	63
Belkin	US	58
PHILIPS	NL	58

Qi compliant product manufacturer / Qi licensees

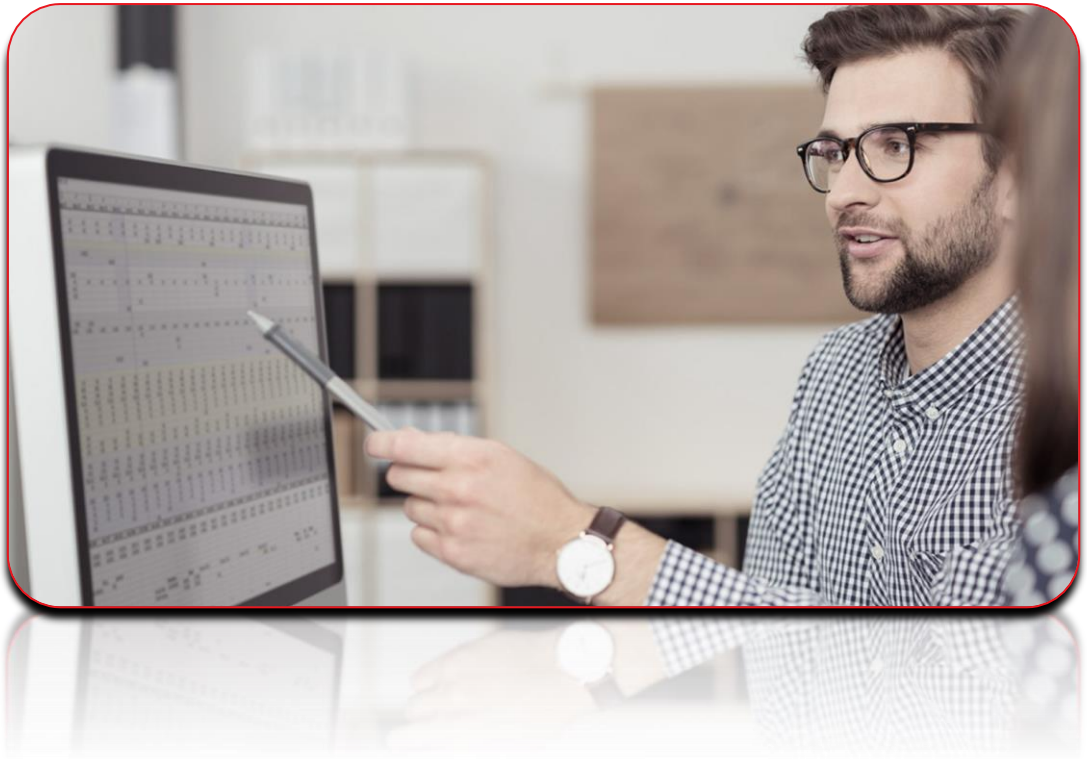
- Qi standard certified products, by region of product manufacturer HQ



The Qi Standard Undeclared Patents Use Case

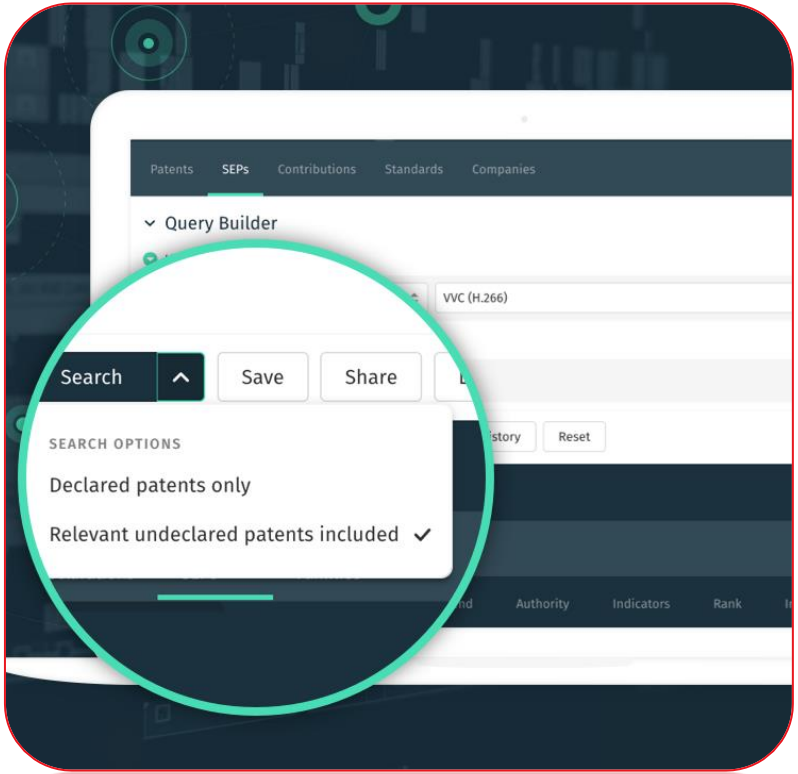
What IPlytics undeclared patents offers

- IPlytics **Undeclared Patent Universe** provides a **Qi standard landscape** of potentially essential patents.



What IPlytics undeclared patents offers

- It allows **discovering patents** that may be essential, even though they're not publicly listed.
- It enables to gain a clear view of the **competition** in the Qi standard sector.



Query Builder

Untitled Query Edit Code Preview Quick Help

Select All e.g. biotech, 3D print*, car or vehicle

AND Technology Generation Select...

AND Ultimate Owner eg "LG Electronics" OR "Nokia"

Add Query

Related Keywords:

Search Save Load History Reset Visual Expert

Results: Analytics Search Data

Results: Analytics

Currently no analytics visible. Please use the query builder above to construct a relevant search.

Need Help?

Use Cases for Licensors

Patent Portfolio Manager:

- Benchmark your Qi related patent portfolio against competitors.
- Monitor your market share for Qi related patent families.
- Identify strength and weaknesses to further develop your Qi related patent portfolio.

Use Cases for Licensors

Licensing Executives / Deal Maker:

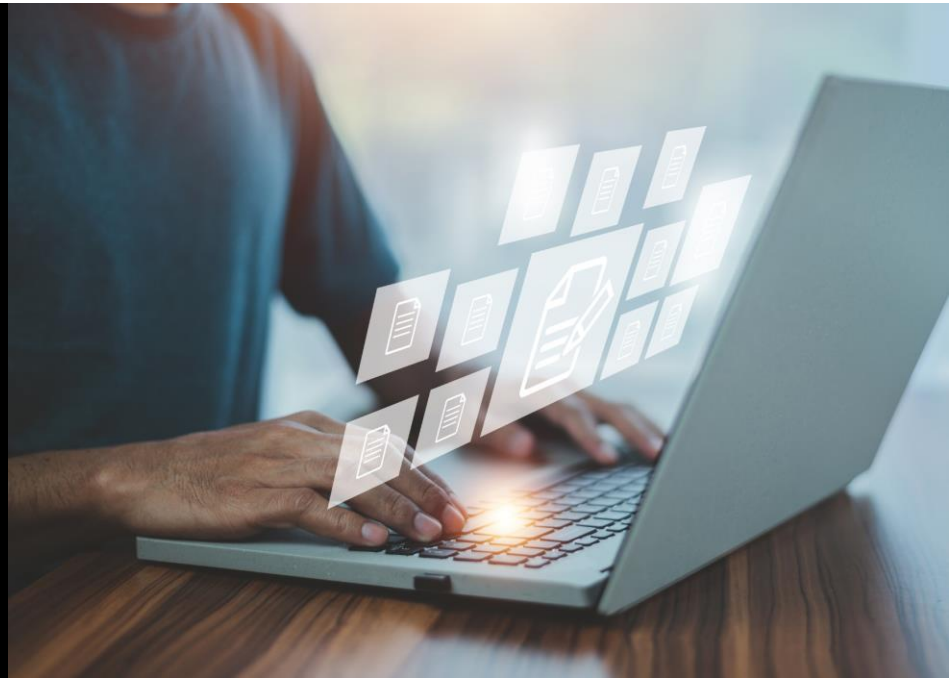
- Identify relevant Qi patents in your portfolio.
- Identify Qi related patents to commercialize/license, join patent pools, sell or abandon.
- Weed out ‘weaker’ patents, focusing resources on higher ranked patents.

Use Cases for Licensees

Legal / Licensing Manager:

- Identify the share of the Qi related patent portfolio or patent pool portfolio offered for licensing-in.
- Get access to objective data to consider for FRAND preparation, negotiations, argument formulation.
- Estimate if offered Qi patent licence is comparable (e.g. to pool license) or excessive.

Qi Standard
Comparable Licensing



Qi standard pool rates

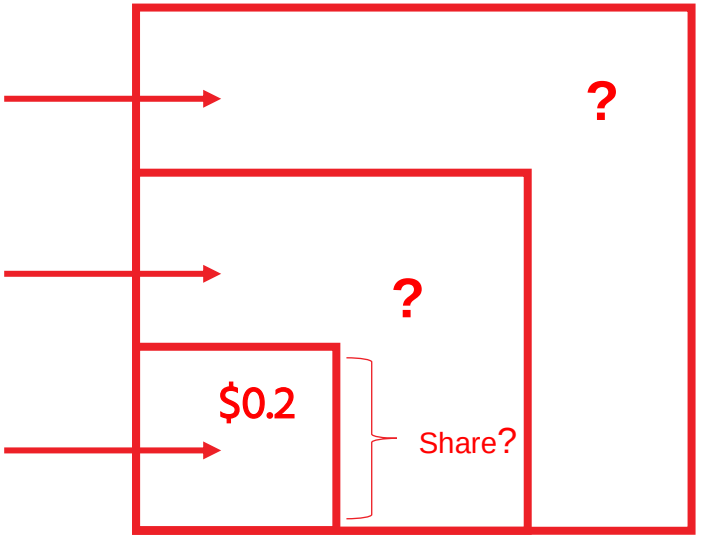
Pool Admin	Rates per device	Source
Via LA	Receivers = $0,20	https://www.via-la.com/licensing-2/qi-wireless-power/qi-wireless-power-license-fees/
Via LA	Transmitters = $0,25 - $0,85	https://www.via-la.com/licensing-2/qi-wireless-power/qi-wireless-power-license-fees/

Uncertainty about the Qi patent royalty stack

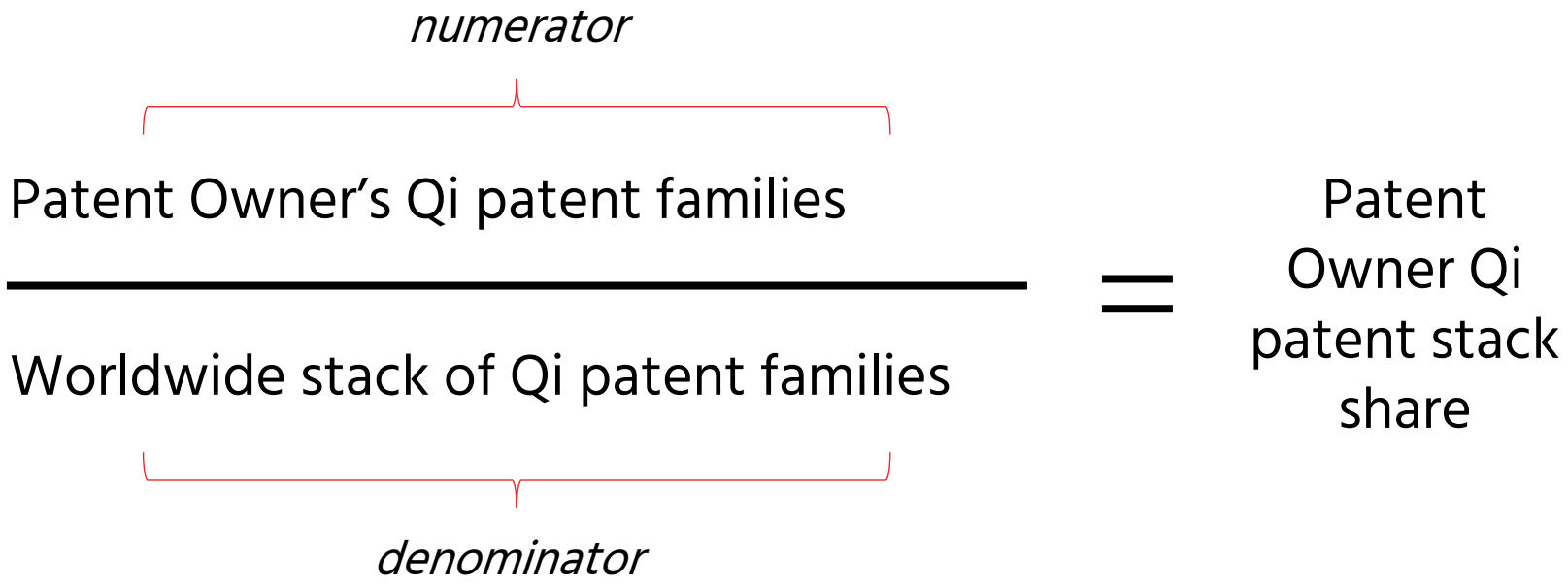
Royalty ask from
unknown Qi licensors

Royalty ask from
known Qi licensors

Royalty ask from
Via LA Qi patent pool

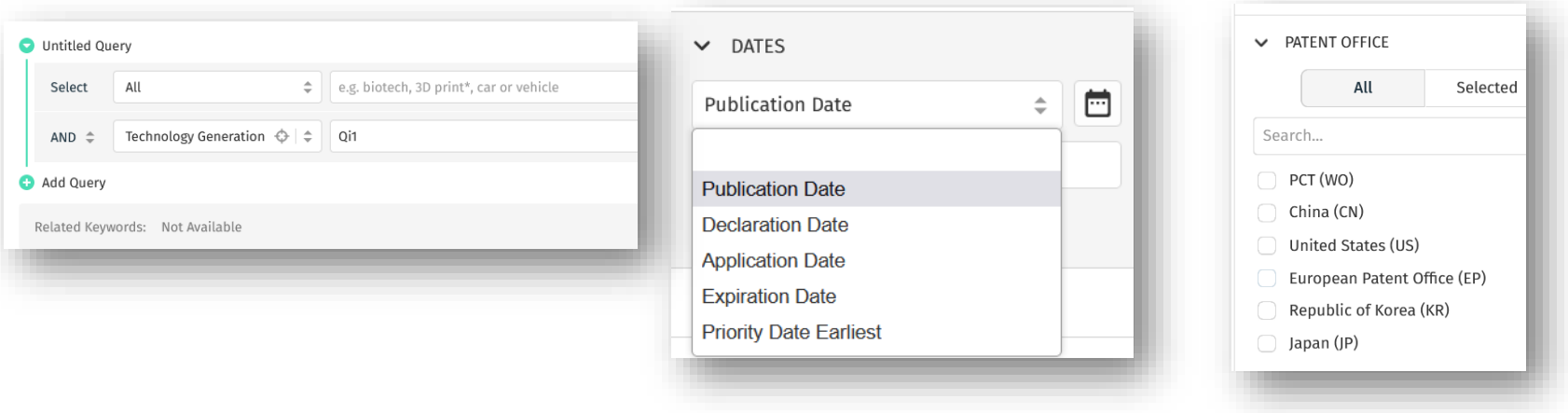


Determine the Royalty Share of a patent owner / pool



Identify the licensors SEP share with IPlytics

- In a first step, you need to identify the **patent owner's share** of patent families for the respected **standard**, for the respective **market** and **time**.
- With IPlytics you can chose the **standard**, standard **version/release**, **date** range and **jurisdiction**:



Identify the Via LA Qi patent share with IPlytics

Ultimate Ow...	SEPs	Fam.	Share
Qi standard pool	1,129	504	19.8%
Canon	138	99	3.9%
Philips	261	97	3.8%
Panasonic	175	87	3.4%
GE	117	54	2.1%
Intel	95	51	2%
WiTricity	198	48	1.9%
LG Innotek	97	38	1.5%
Bosch	29	20	0.8%
Hyundai Mobis	15	6	0.2%
CHENGDU CONVENIENTPOWER	4	4	0.2%

Use **IPlytcs Grouping Feature** to aggregate the Via LA Qi pool members*

https://www.via-la.com/licensing-2/qi-wireless-power/qi-wireless-power-licensors/

Ultimate Ow...	SEPs	Fam.	Share
Qi standard pool	1,129	504	19.8%
Samsung	485	241	9.5%
Apple	235	145	5.7%
LG Electronics	185	90	3.5%
Qualcomm	196	80	3.1%
Sony	195	80	3.1%
Chemtronics (Korea)	91	79	3.1%
Renesas	64	48	1.9%
Rohm Company	50	43	1.7%

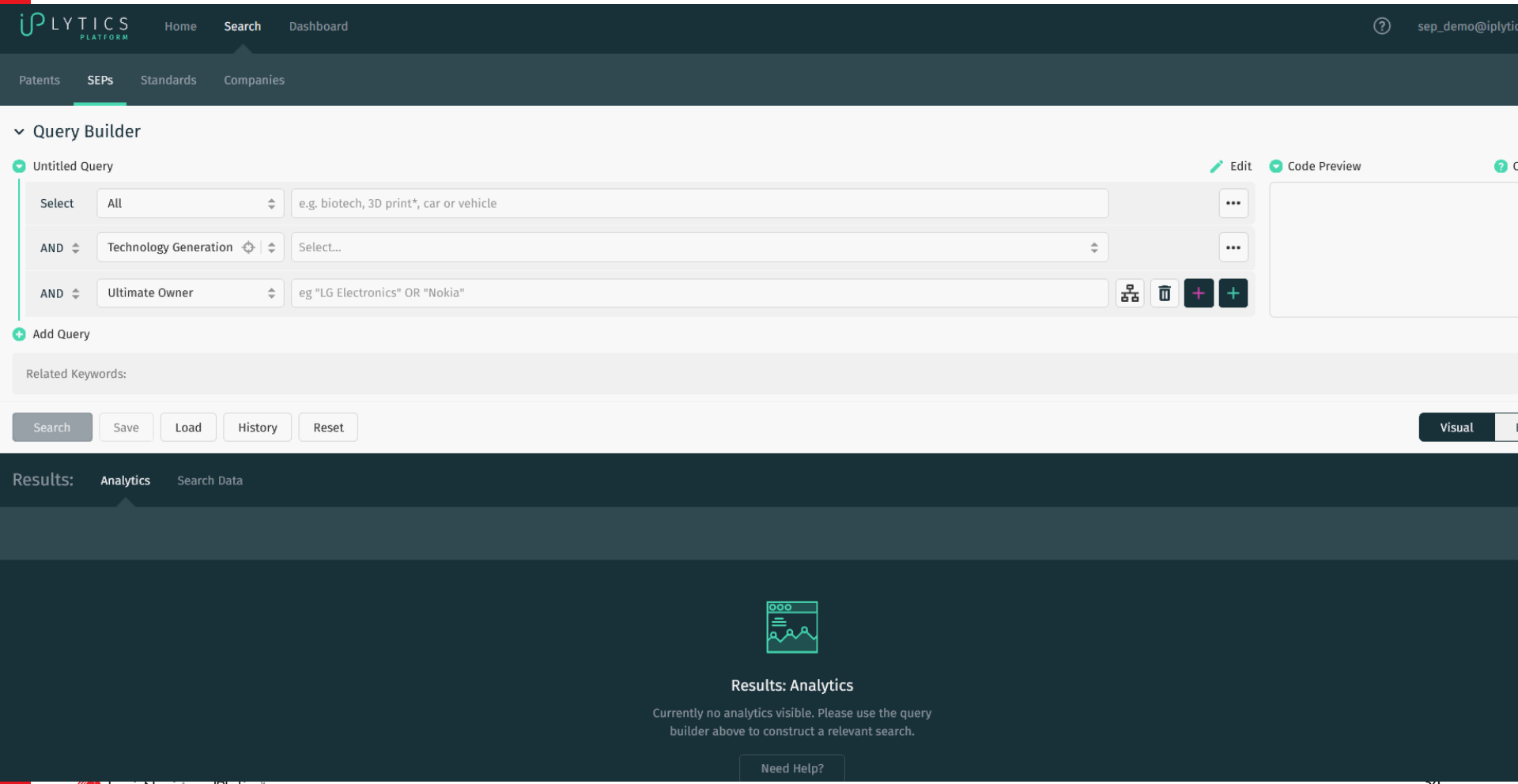
Identify the licensors SEP share

- Via LA offers Qi SEP for **$0.2 per smart phone (receiver)**
- Via LA Qi pool share is **19.8%**

Using pool data as a reference point results in a cumulative royalty :

(100 / **19.8**) x $0.2 per unit = **$1,01 per unit**

➢ The aggerated royalty for a Qi compliant smart phone is only at ~**$1 per unit**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Standards
Companies
Query Builder
Untitled Query
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Select
All
e.g. biotech, 3D print*, car or vehicle
AND
Technology Generation
Select...
AND
Ultimate Owner
eg "LG Electronics" OR "Nokia"
Add Query
Related Keywords:
Search
Save
Load
History
Reset
Visual
Results:
Analytics
Search Data
Results: Analytics
Currently no analytics visible. Please use the query builder above to construct a relevant search.
Need Help?

IPlytics in a Nutshell

Coverage of worldwide SEP and contribution **data**

- Access to SEP declarations from over 25 standards organizations (over **580k declared patents**),
- Access patent pool listed SEPs from over 10 patent pools (over **60k pooled patents**),
- Access to standards contributions for cellular, wireless and video codecs (over **2M standards contributions**)

Refinement features for SEPs and standards data

- SEPs/contributions can be refined by technology generations (3G/4G/5G, AVC/HEVC/VVC, Wi-fi 4/5/6/7), standards groups and releases (RAN 1, JVET, TGbe, Release 11-18) and protocols (NB-IoT, V2X)

Value standard essentiality (IPlytics **Semantic Essentiality Score**)

- Estimate declared patents' claims likelihood of being essential to declared standards document sections

Identify undeclared patents (IPlytics **Undeclared Patents**)

- Identify patents hidden under blanket declarations for technologies such as video codec (AVC/HEVC/VVC) and Wi-Fi (Wi-Fi 4,5,6).

IPlytics Data - Reference Point

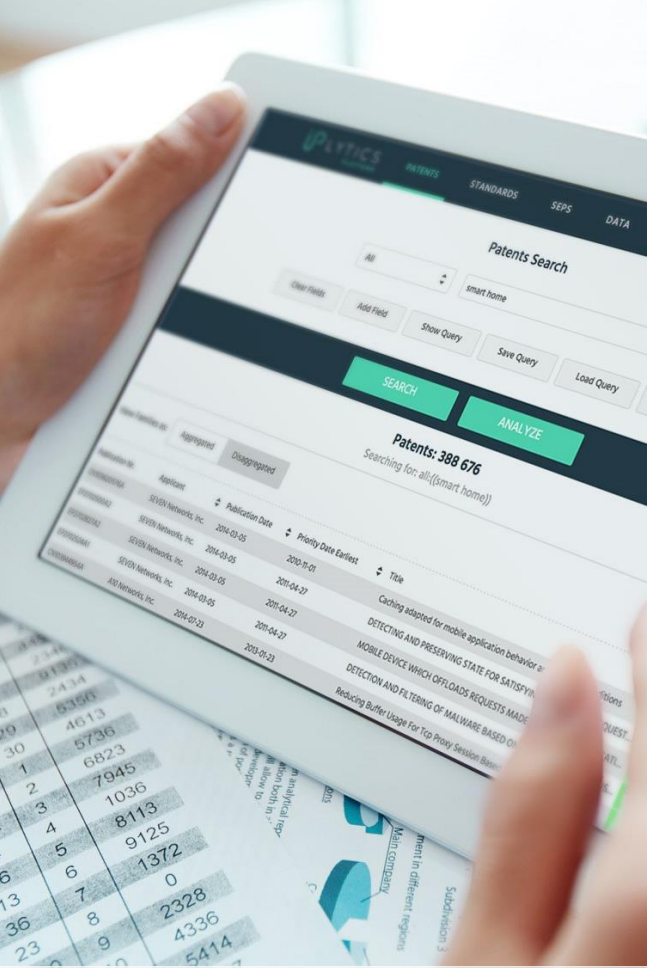
IPlytics data is a worldwide accepted reference point

IPlytics is the most trusted SEP solution in the world - there is nothing that compares with the IPlytics data quality, data coverage and SEP-specific features (SES and undeclared patents):

- 97% of the top 30 SEP holders are IPlytics customers
- Courts reference IPlytics in FRAND determination cases
- IPlytics is used by both implementers and SEP licensors in licensing negotiations as a reference point

Patent Data Can Be One Reference Point – Among Others:

- SEP licensing involves complex negotiations.
- Cleaned and curated patent declaration data can serve as one reference point among others, including details on past contracts, comparable license agreements, claim charts, subject matter expert testimony and more.



Questions?

For more information on LexisNexis® IPlytics please visit: www.lexisnexisip.com/iplytics/

Or request a demo at: www.lexisnexisip.com/iplytics/demo

Thank You

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