iPLYTICS | Intellectual Property Analytics

Patents and Standards in IoT

IPlytics GmbH

2019

IoT- The Internet of Things and Patents

o The vision of the IoT is for vehicles, roadways, machines, containers, ships, and even refrigerators, among others, to be equipped with sensors to interconnect and constantly exchange information

o Interconnectivity of different objects relies on the usage of often patented technology responsible for the basic communication of IoT systems

  ➢ Broadly written patents have the potential to threaten numerous industries and businesses that integrate IoT technologies, raising the spectre of an uncertain level of legal risk

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Searching IoT patents in IPlytics Platform

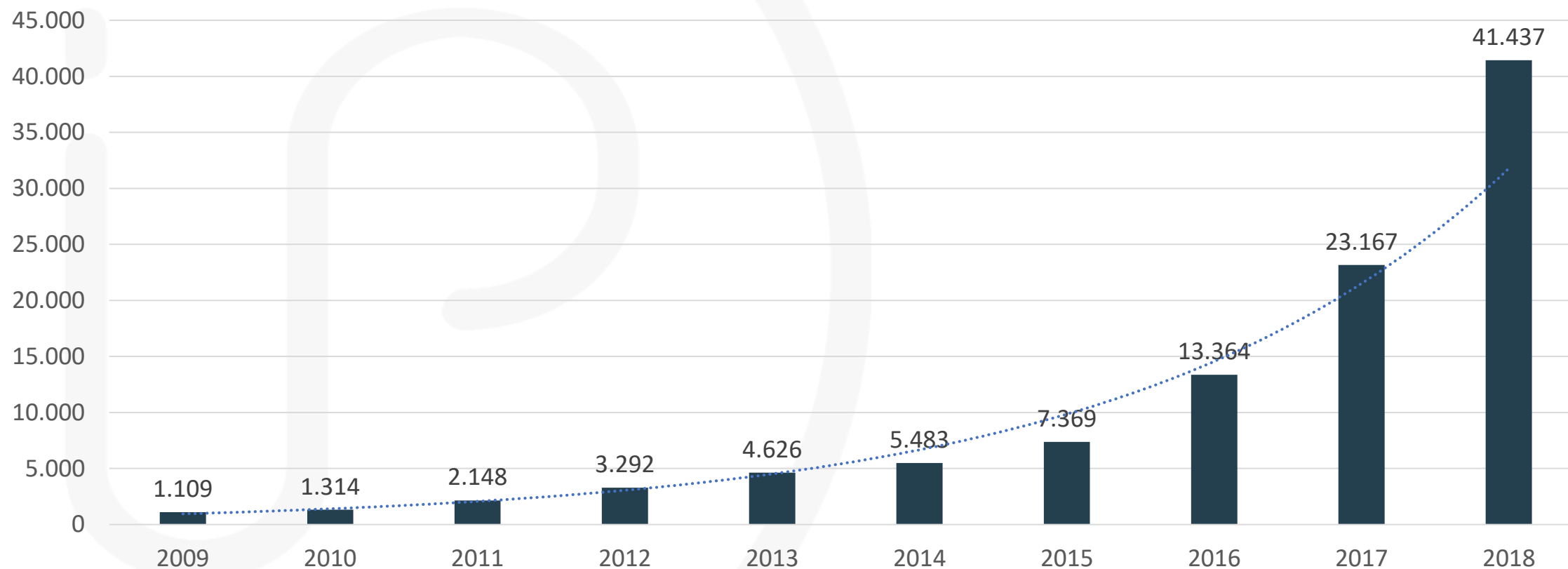## Query Builder

Untitled Query ✏ Edit

| Select | All | "Internet of Things" OR "Internet of Everything" OR "Web of Things" | ••• |

IoT - Internet of Things **Patent Trends**

IoT patent applications over time as to application date

| Year	Value
2009	1.109
2010	1.314
2011	2.148
2012	3.292
2013	4.626
2014	5.483
2015	7.369
2016	13.364
2017	23.167
2018	41.437

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Searching IoT litigation in IPlytics Platform

o IPlytics integrates data from Darts-IP which gives access to 250,000 worldwide litigated patents
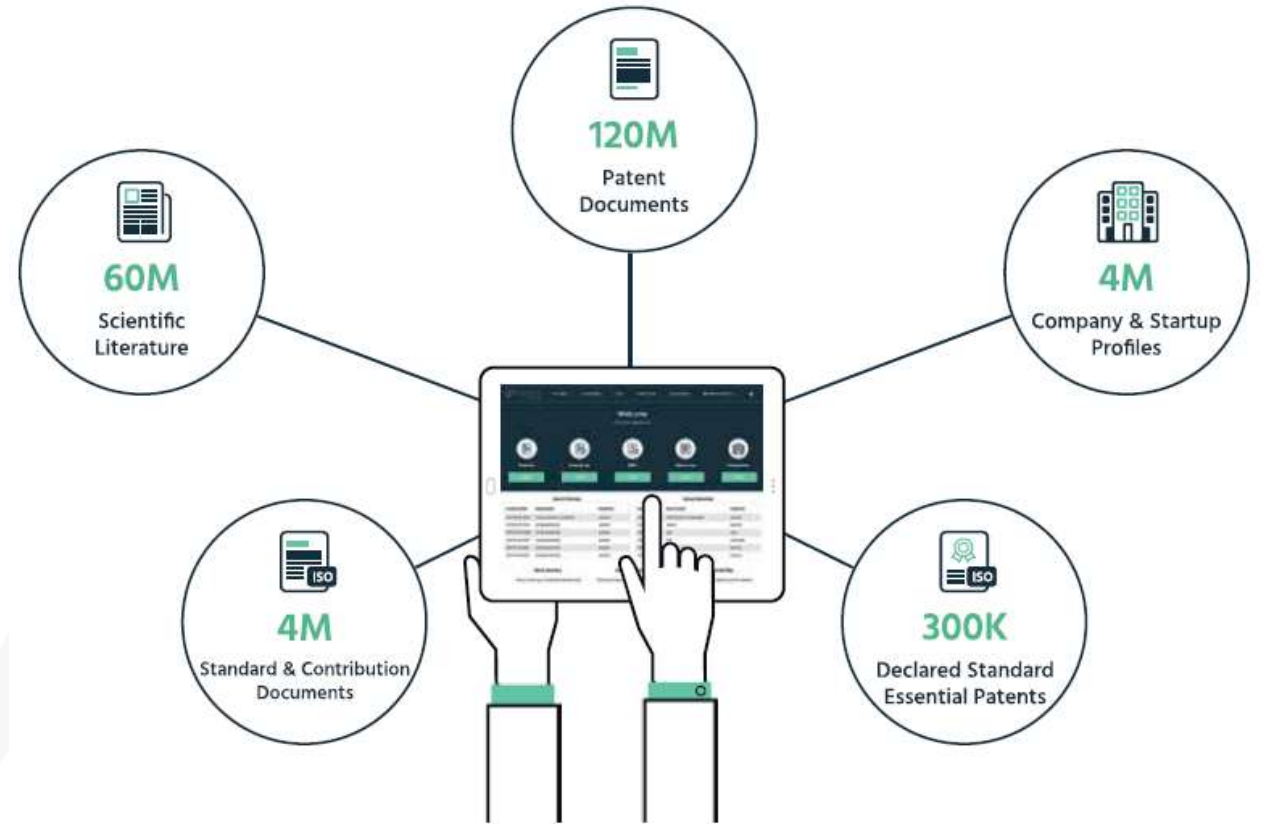
IoT - Internet of Things Patent **Litigation** Trends

o **IoT patent litigation** has been sharply increasing since 2010

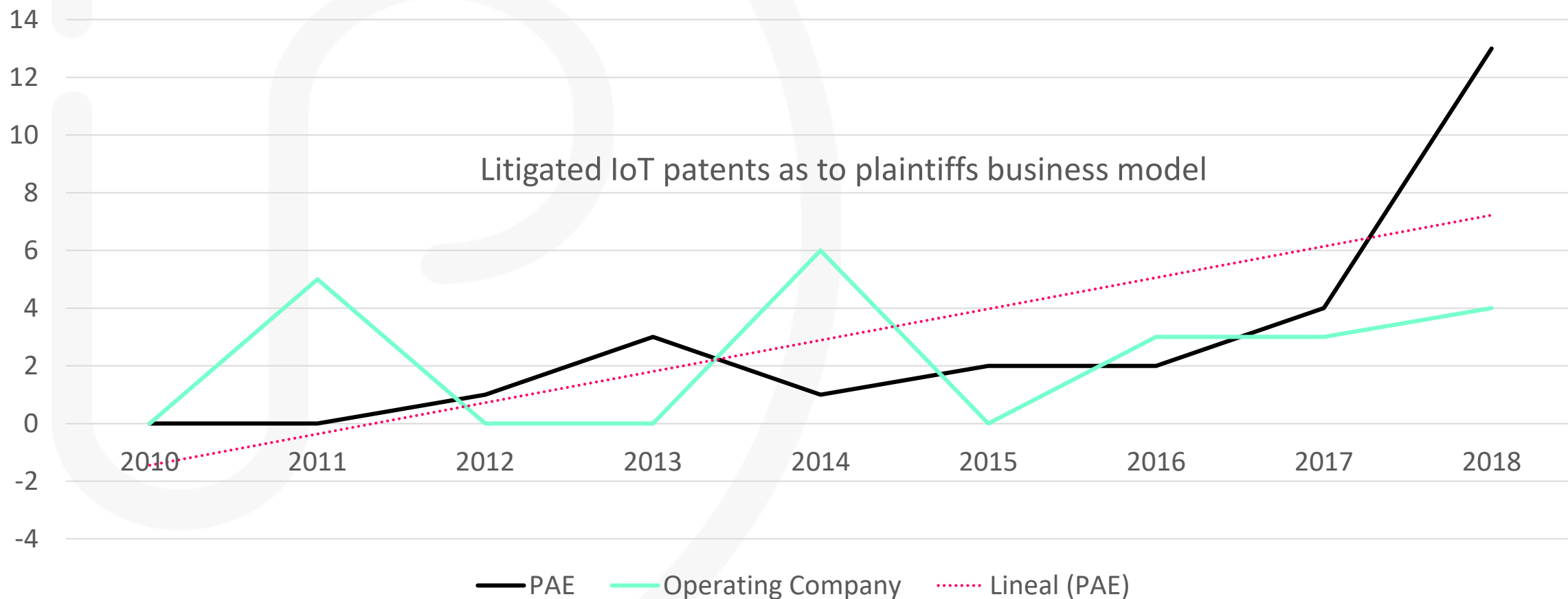Cumulative number of litigated IoT patents
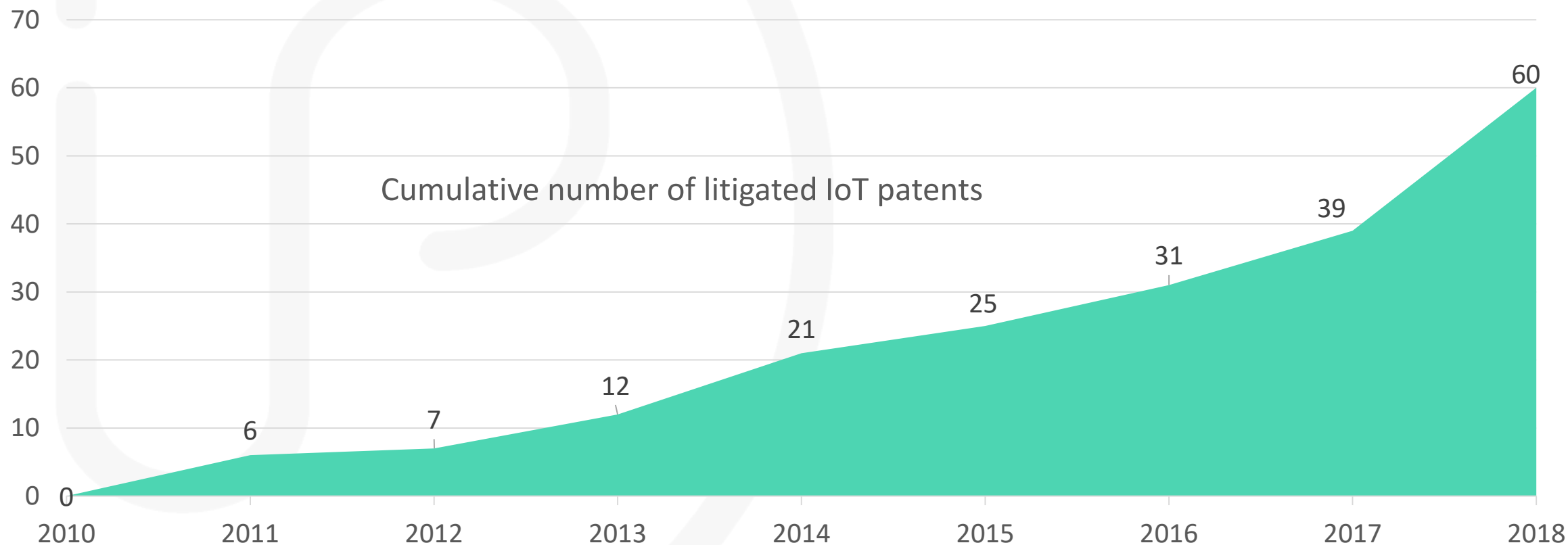
IoT - Internet of Things **PAE** AquisitionTrends

○ **PAEs** - "Patent Assertion Entities" have been increasingly **acquiring IoT patents** to monetize them in the industry

Acquired IoT patents by PAEs

Ø 230%

————— PAE acquired IoT patents   ·········· PAE acquired IoT patent trend
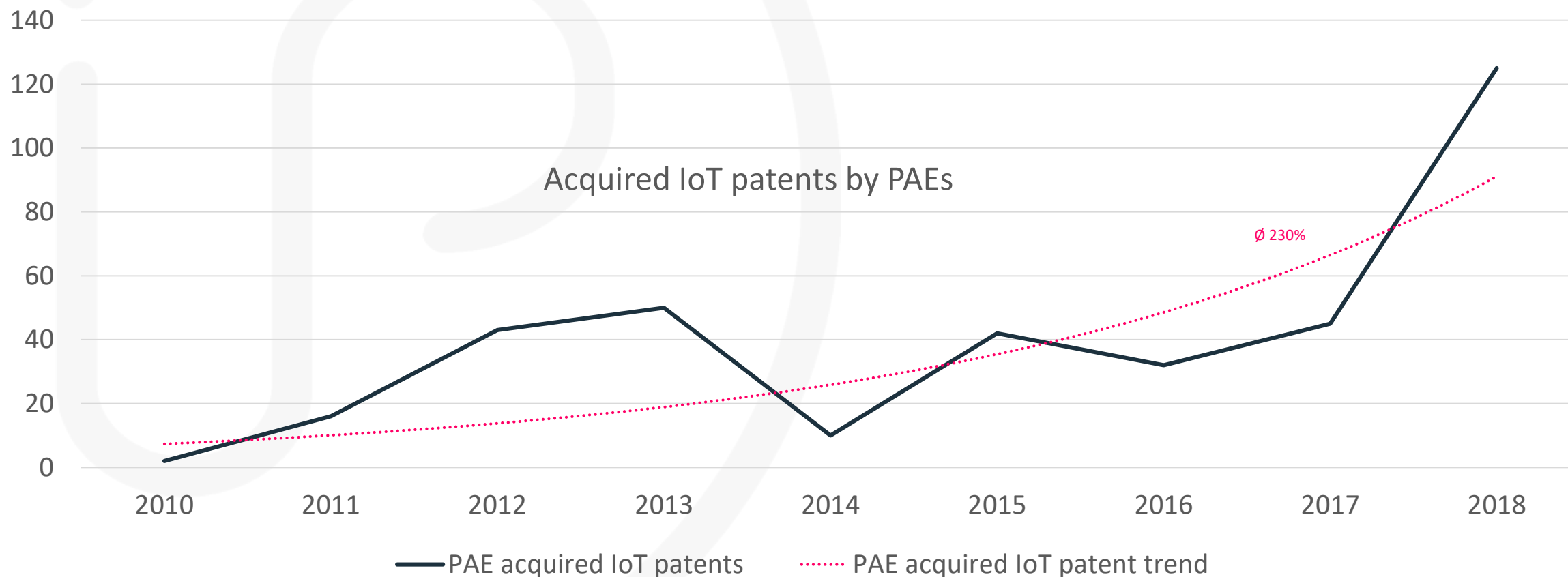
IoT - Internet of Things **PAE** Patent Litigation Trends

○ **PAEs** - have been increasingly enforcing **IoT patents** in international courts

Litigated IoT patents as to plaintiffs business model

Legend: PAE — Operating Company ····· Lineal (PAE)

The Internet of Things and SEPs

o **Technology standards** allow different eg vehicles, roadways, containers, ships, machines or whole factories to communicate in **IoT systems**

o While in the past technology standards such as 3G, 4G or Wifi have been mostly used in the communication and computer industry future **IoT application of standards** will also affect industries such as eg:

   o Automotive
   o Industrial Manufacturing
   o Energy
   o Healthcare

Standards and Connectivity – **Smart Cars**

➢ **3G, 4G** and **5G** allow cars to exchange information with roadsides, traffic lights or buildings

➢ DSRC (**802.11p**) allows cars to connect to other cars

➢ **NFC** allows to open cars without a key
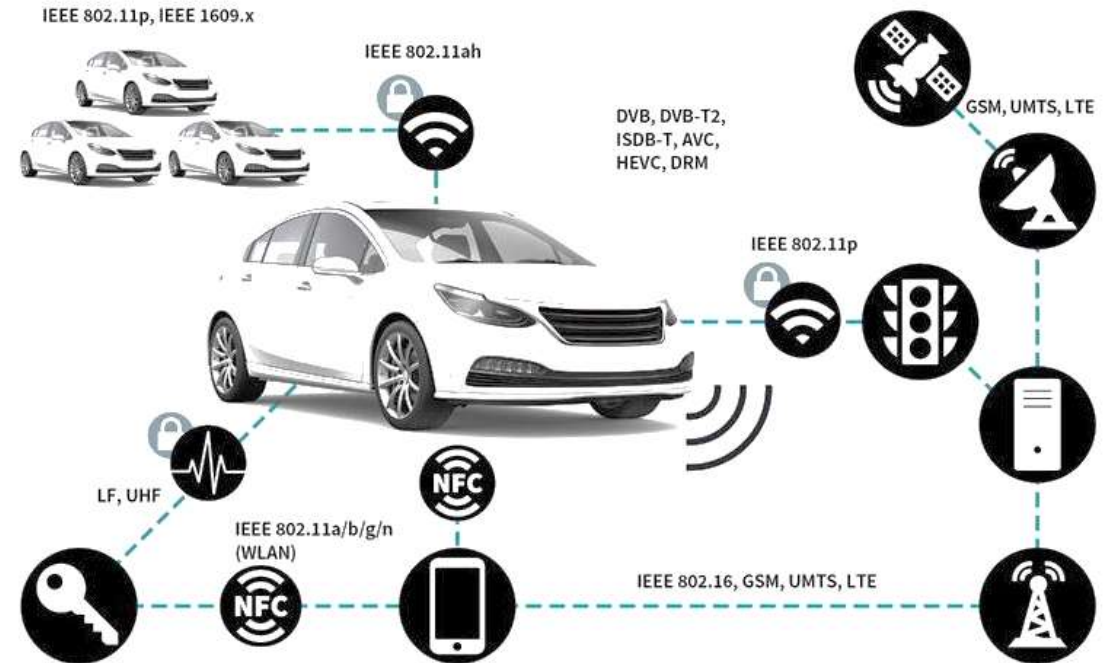
Standards and Connectivity – **Smart Factory**

➤ Privat **5G** networks connect machines with the cloud services and data centers

➤ **RFID** allows to identify machine components

➤ **Bluetooth** allows to connect sensors
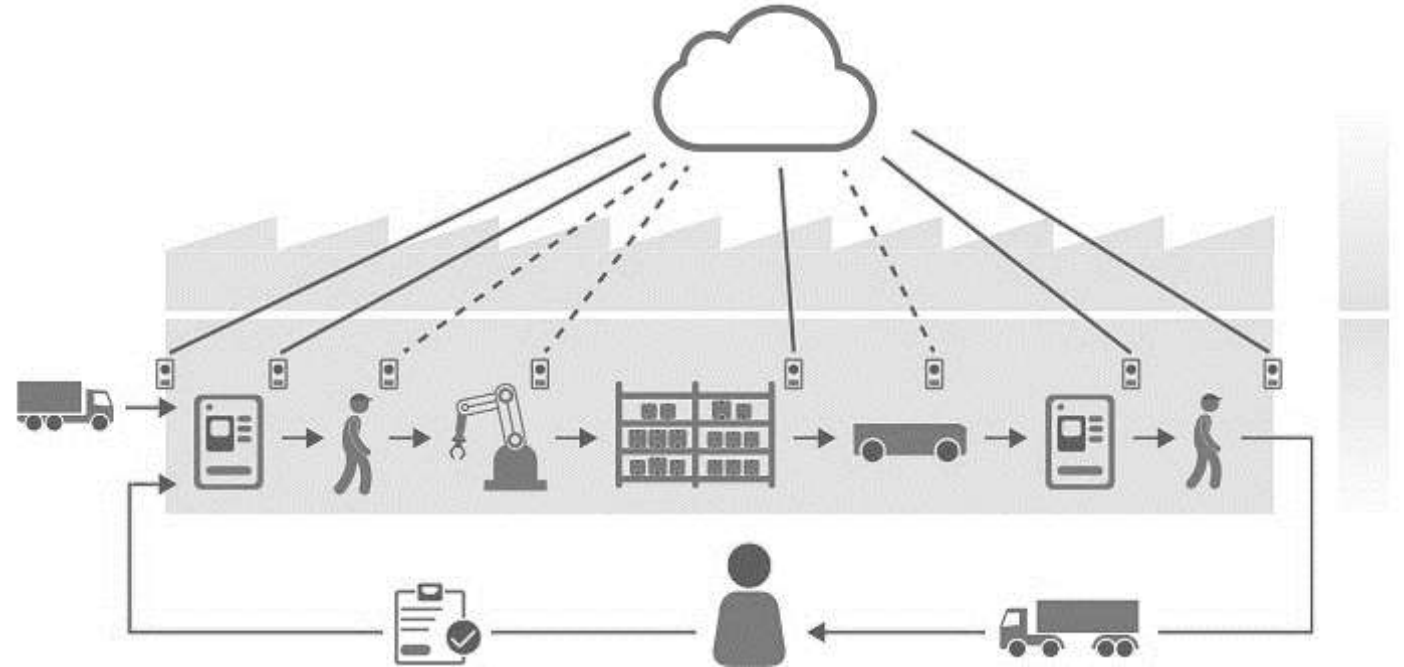
Standards and Connectivity – **Smart Energy**

➢ **3G, 4G** and **5G** connect smart meters with cloud services in the Internet

➢ **WiFi** allows to connect energy consumption sensors with local data centers
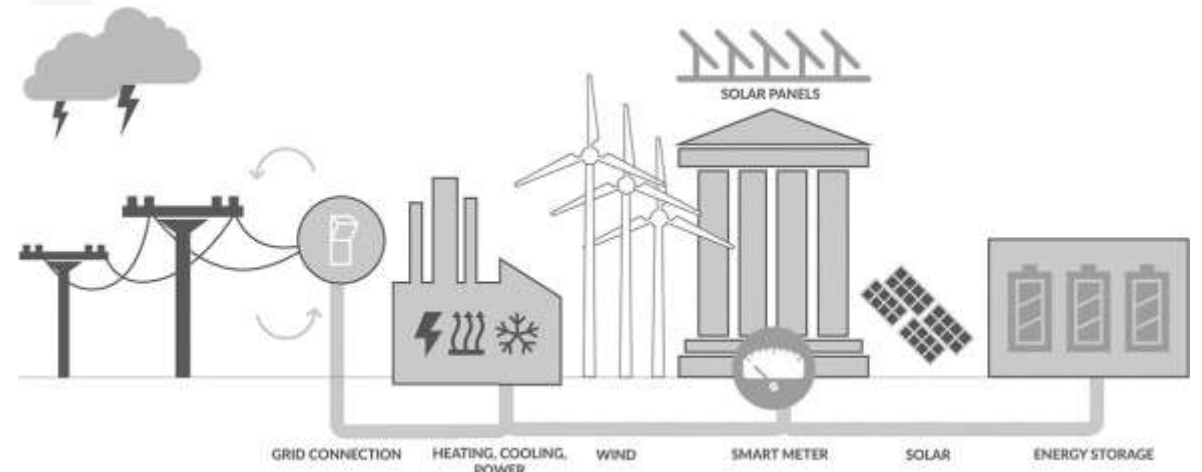
The challenge of Standard Essential Patents in IoT

➢ Standards such as 3G/4G/5G, 802.11 or HEVC are **highly patented**

➢ The integration of the highly patented standards **creates economic risks** for manufacturers using IoT sensors

➢ Royalty rates –in cellular communications standards such as 4G and soon 5G – can easily mount up to **hundreds of millions of dollars a year**

Declared 5G SEP families; 14.709

Declared 3G SEP families; 7.800

Declared 4G SEP families; 20.471
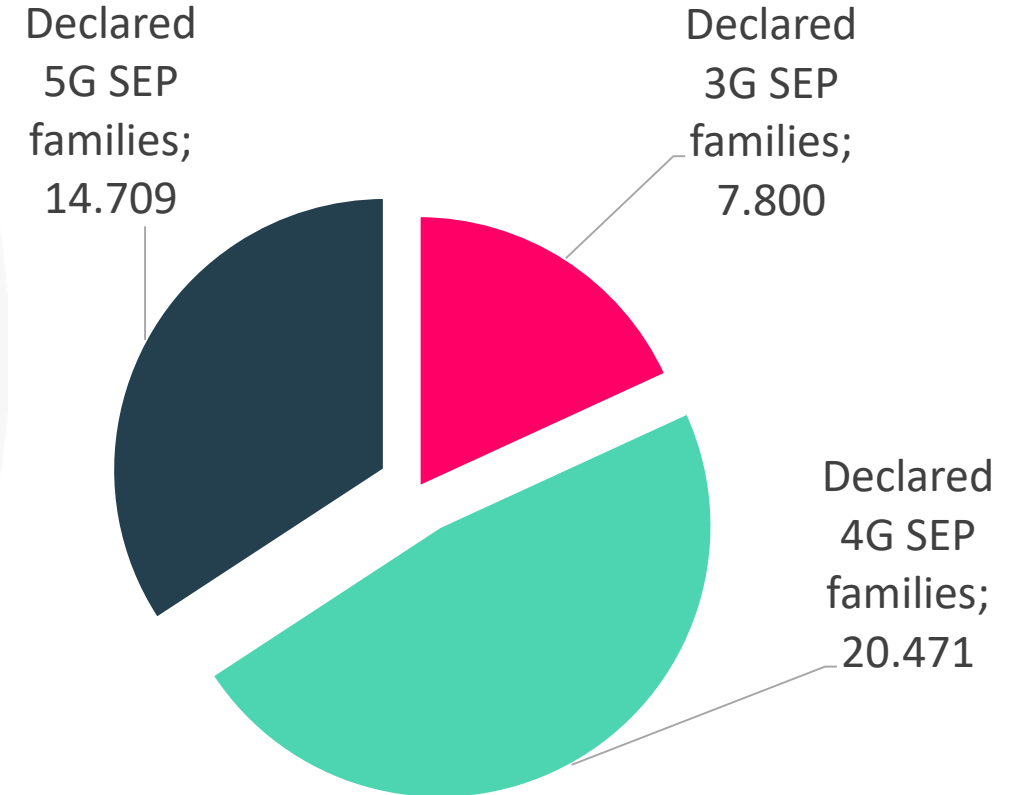
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IPlytics SEP Data source

120 M
Patent Documents

Worldwide Patents (USA, Europe, Korea, Japan, China, etc.)
- Extended patent families
- Legal status (pending/granted, lapsed/revoked/active/expired)
- Worldwide **reassignment** information
- Worldwide **litigation** information

300.000
SEP declarations

Declared Standard Essential Patents
- 30 SDOs and 11 patent pools
- Patent and standards document ID
- **Licensing** commitments (e.g. FRAND, reciprocity)
- **Patent Pools**

4 M
Standards / Contributions

Standards Documents
- 2,5 M standards documents (Full text, author, supporting company)
- 1,5 M standards contributions (Full text, author, contributing company)
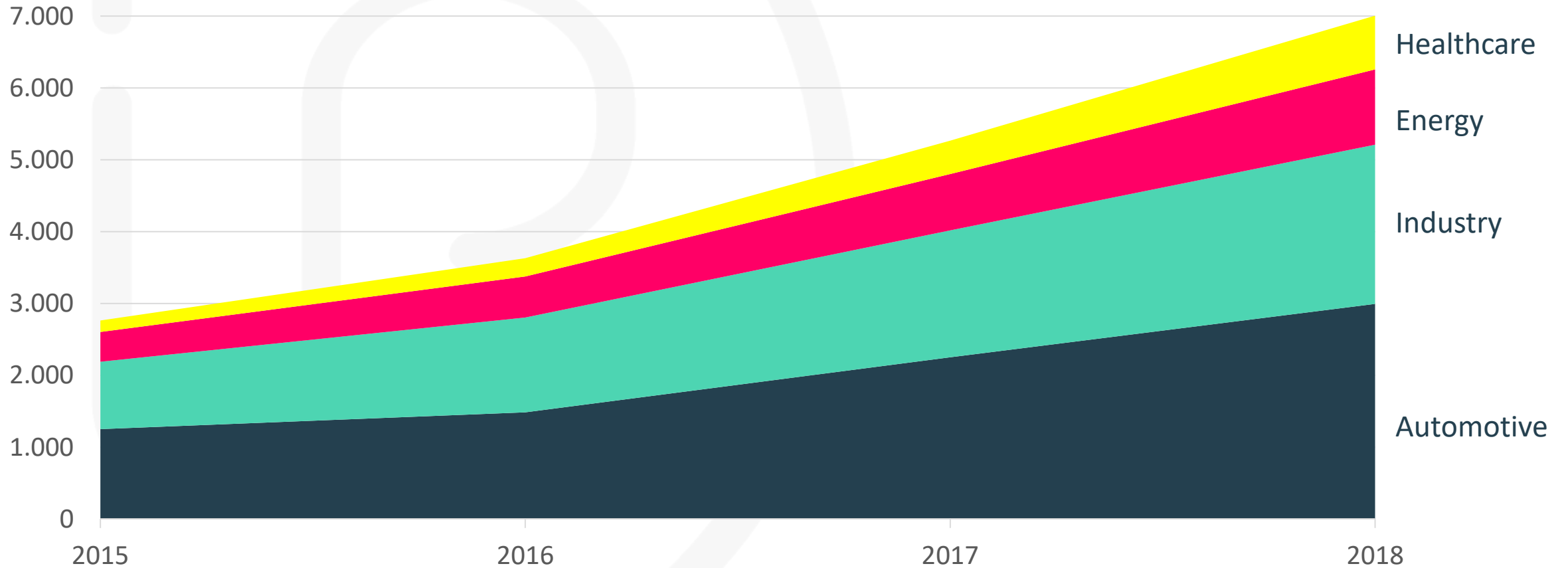- Type (TS, TR, CR, WI), Status (revised, agreed, approved, noted)
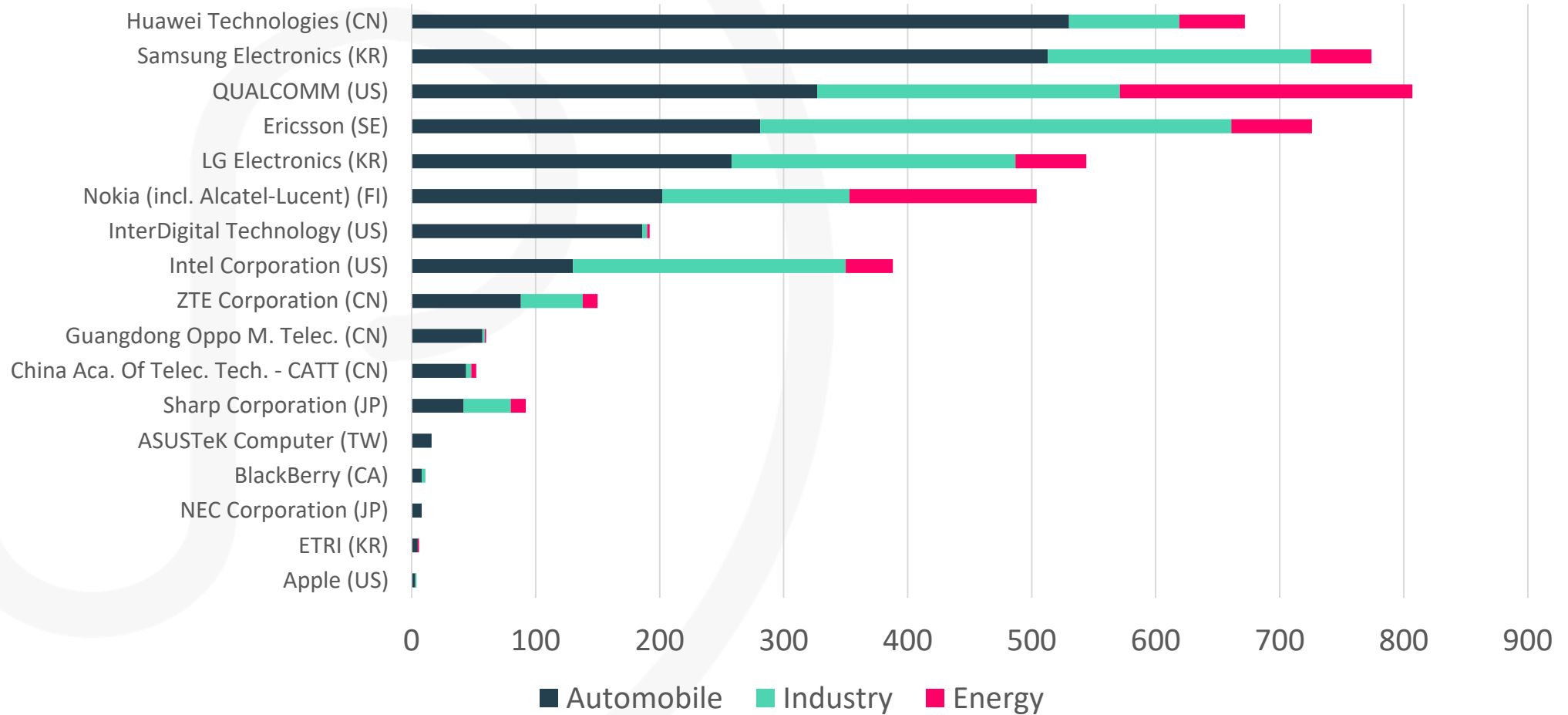
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SEPs as to field of IoT application over time

Declared Standard Essential Patents as to IoT field of application over time

SEPs as to IoT application per company

Declared 5G SEP families as to field of application

Huawei Technologies (CN)
Samsung Electronics (KR)
QUALCOMM (US)
Ericsson (SE)
LG Electronics (KR)
Nokia (incl. Alcatel-Lucent) (FI)
InterDigital Technology (US)
Intel Corporation (US)
ZTE Corporation (CN)
Guangdong Oppo M. Telec. (CN)
China Aca. Of Telec. Tech. - CATT (CN)
Sharp Corporation (JP)
ASUSTeK Computer (TW)
BlackBerry (CA)
NEC Corporation (JP)
ETRI (KR)
Apple (US)

0   100   200   300   400   500   600   700   800   900

■ Automobile   ■ Industry   ■ Energy

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Litigated SEPs with IoT application per company

Number of litigated SEPs with IoT application

Company	Value
Nokia incl Alcatel-Lucent	213
Ericsson Inc.	184
Huawei Technologies Co., Ltd.	131
QUALCOMM Incorporated	125
Samsung	86
InterDigital Technology Corp	83
Koninklijke Philips N.V	53
LG Electronics	44
Panasonic Corporation	41
Motorola Mobility	39
BlackBerry	37
Innovative Sonic Ltd	35
Siemens Aktiengesellschaft	34
BlackBerry Limited	30
ZTE_Group	29

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SEP licensing for IoT

**MARKETPLACE**   **TECHNOLOGY**   **POSSIBILITIES**   **PRICING**   **FAQ**

Why Avanci?

Hundreds of companies are entering the connected world each day, with creative products finding new uses for wireless connectivity. For developers of those products, it can be difficult to know what technology rights are needed and how to get them.

From automakers to meter manufacturers – developers of IoT products have asked for an open and efficient way to access the licenses needed for the latest wireless technology.

WIRELESS TECHNOLOGY PATENT HOLDERS
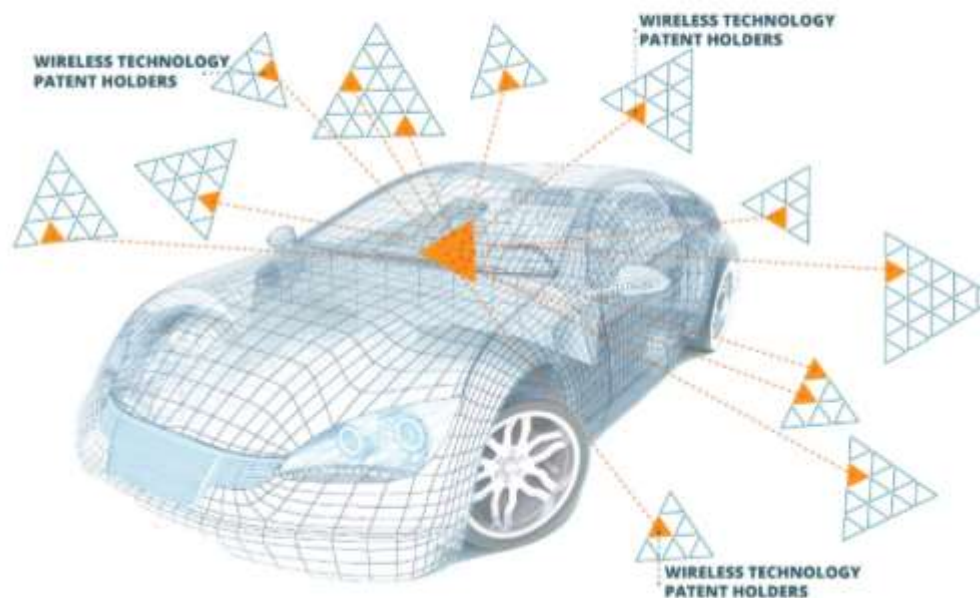
IPlytics will publish two studies on 5G

➢ November 2019: **IPlytics Study on 5G SEPs**

➢ July 2019: **IPlytics Study on SEPs litigation**

Please contact us if you would like to receive a copy of the study!

IPlytics Platform

Contact

Please contact us for a free test account to access the IPlytics Platform data!

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