

# PATENTSIGHT

Big Data Innovation Analytics

**e-Mobility –  
Evaluating top patent owners  
and their portfolios**

# Presenters



**Andreas Lübbering**

*Senior Customer Success Manager at  
PatentSight – A LexisNexis Company*



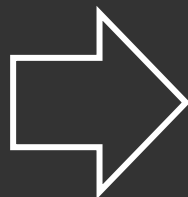
**Sarbani Chattopadhyay**

*Customer Success Manager at  
PatentSight – A LexisNexis Company*

# Why do patents matter?



Key patent  
on relevant  
technology



Commercially  
successful  
product



High  
revenues

# Challenge #1: Data Quality

Patent data is publicly available



Incomplete ownership information



Errors: Wrong translations and misspellings



Ambiguous legal status information

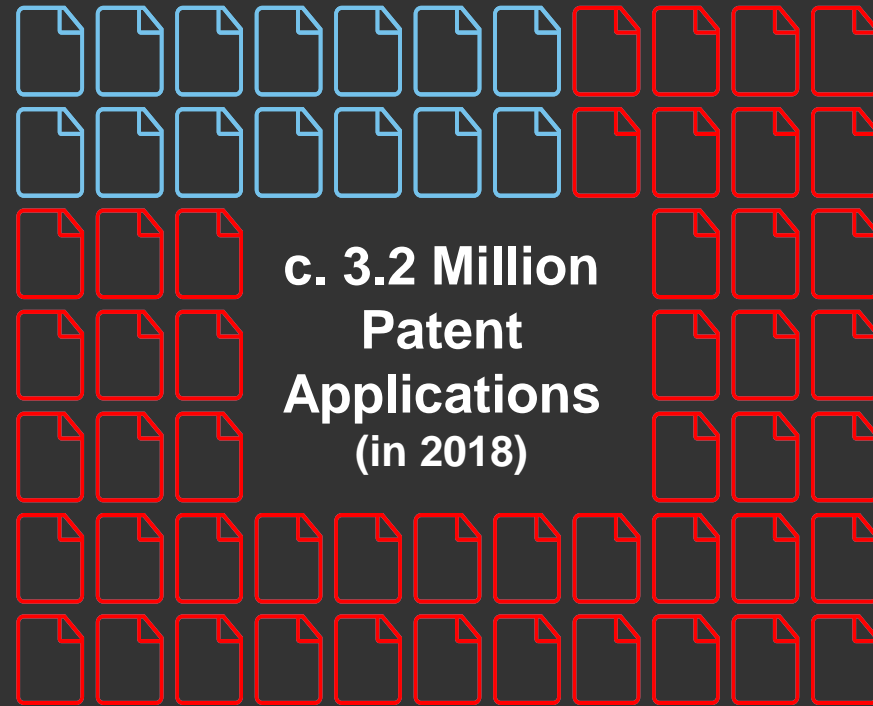
# Challenge #2: Data Masses

Global R&D Expenditures  
2018

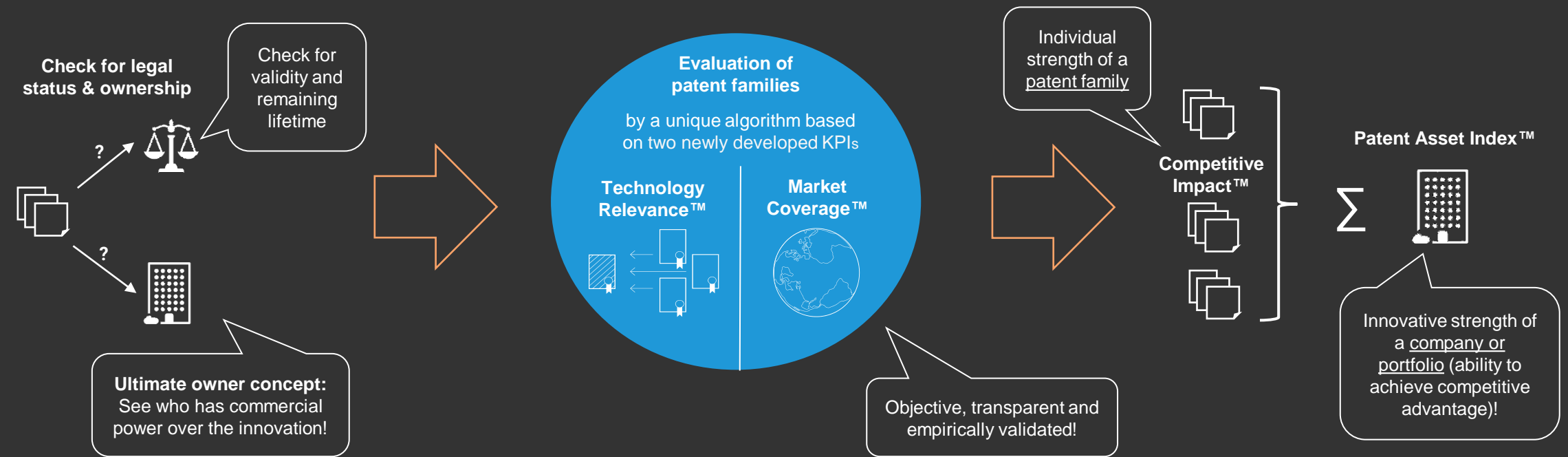
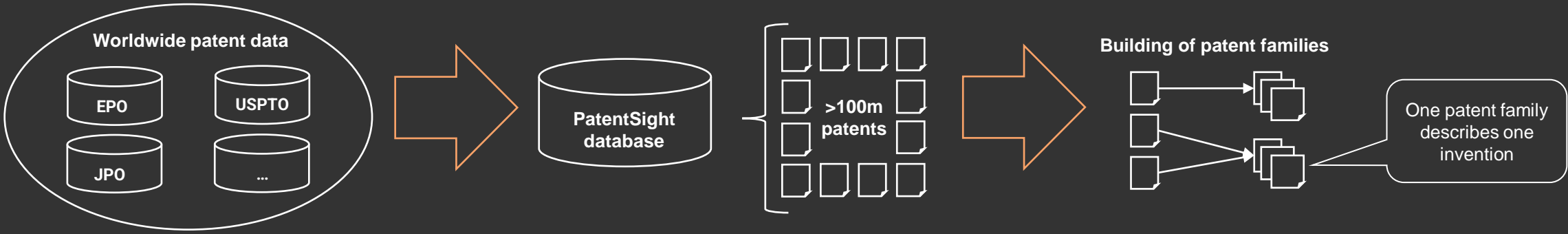


c. 2.3 Trillion USD

About 80% of all patents have no commercial value



# Our approach



To the software



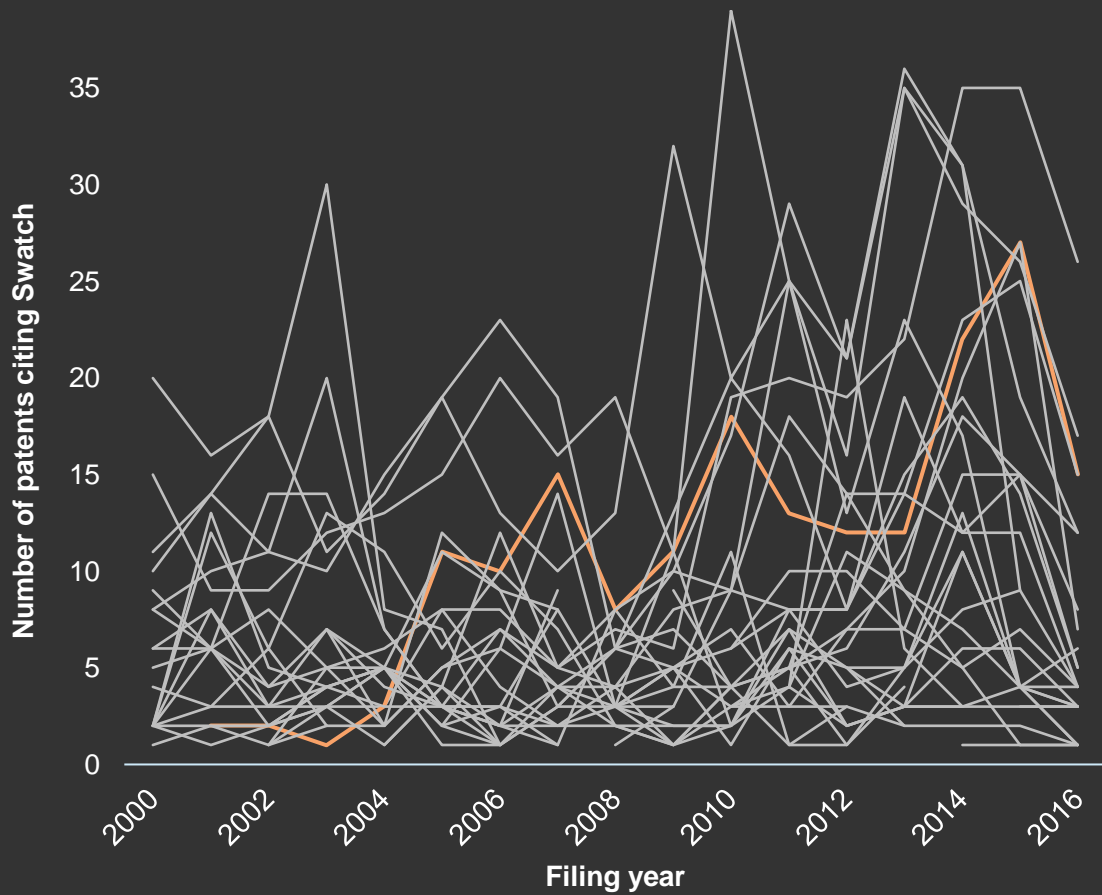
# Use Cases



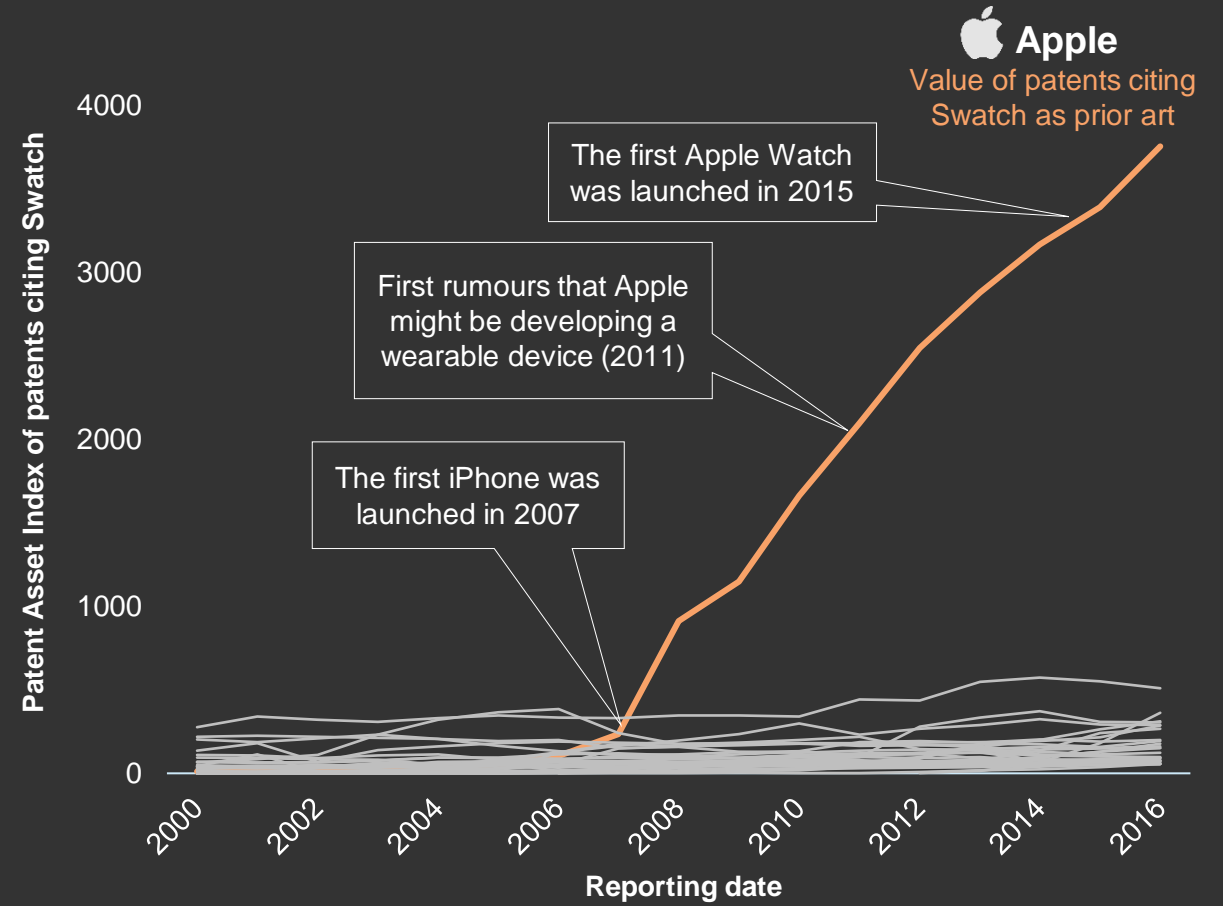
# Trend Scouting



Analysis with conventional patent data

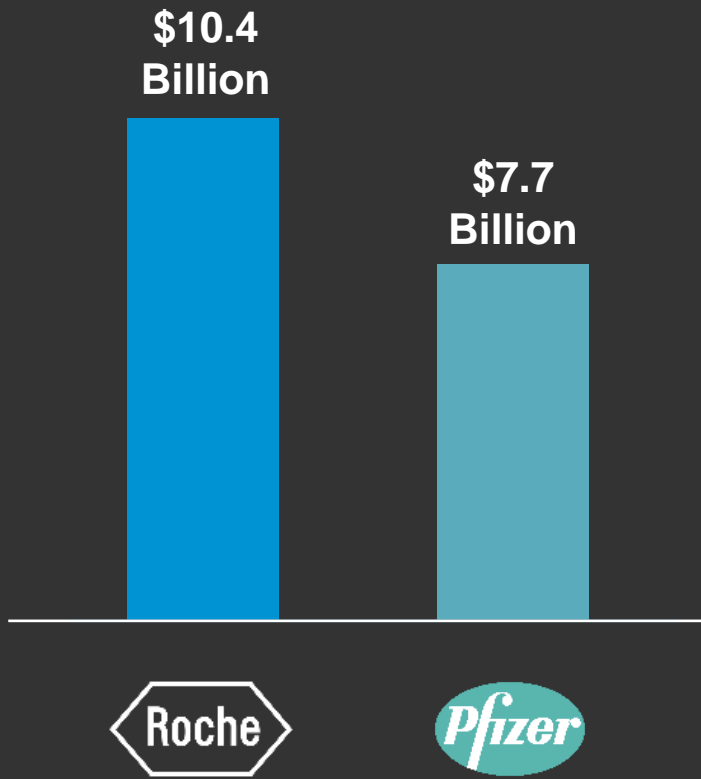


Analysis with Patent Asset Index™ concept applied



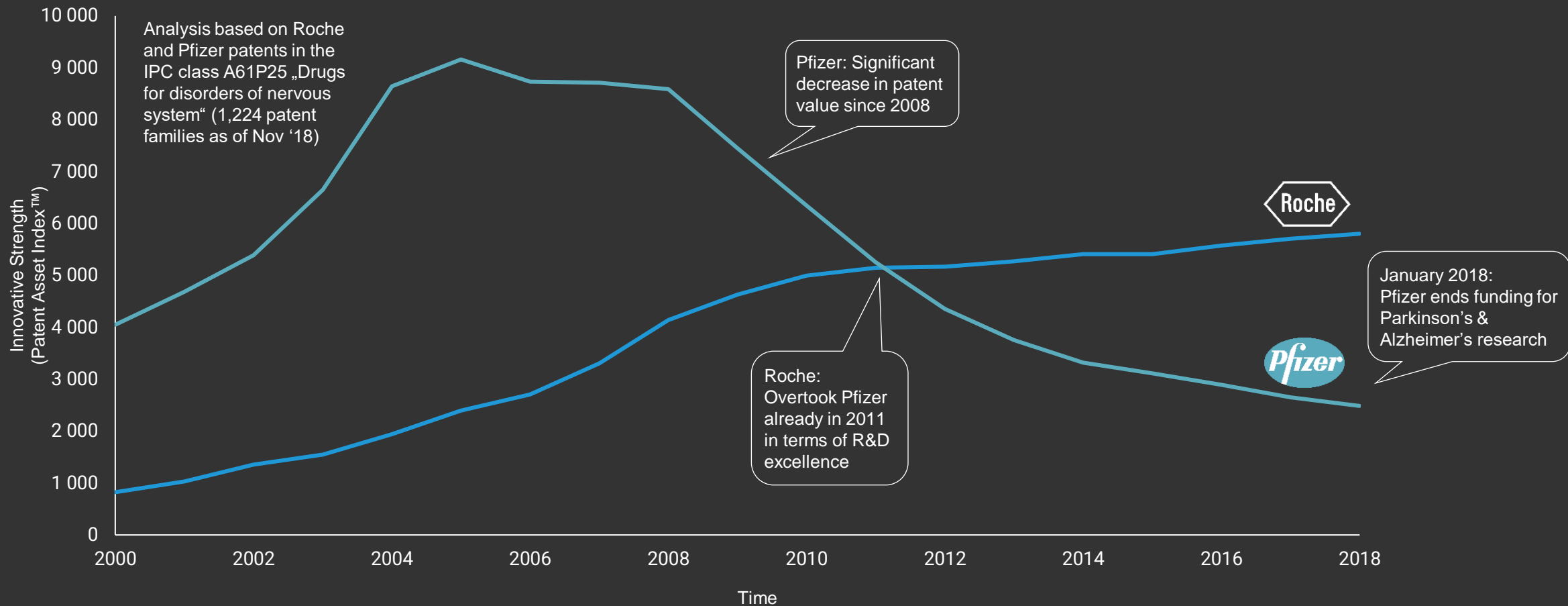
# R&D Benchmarking

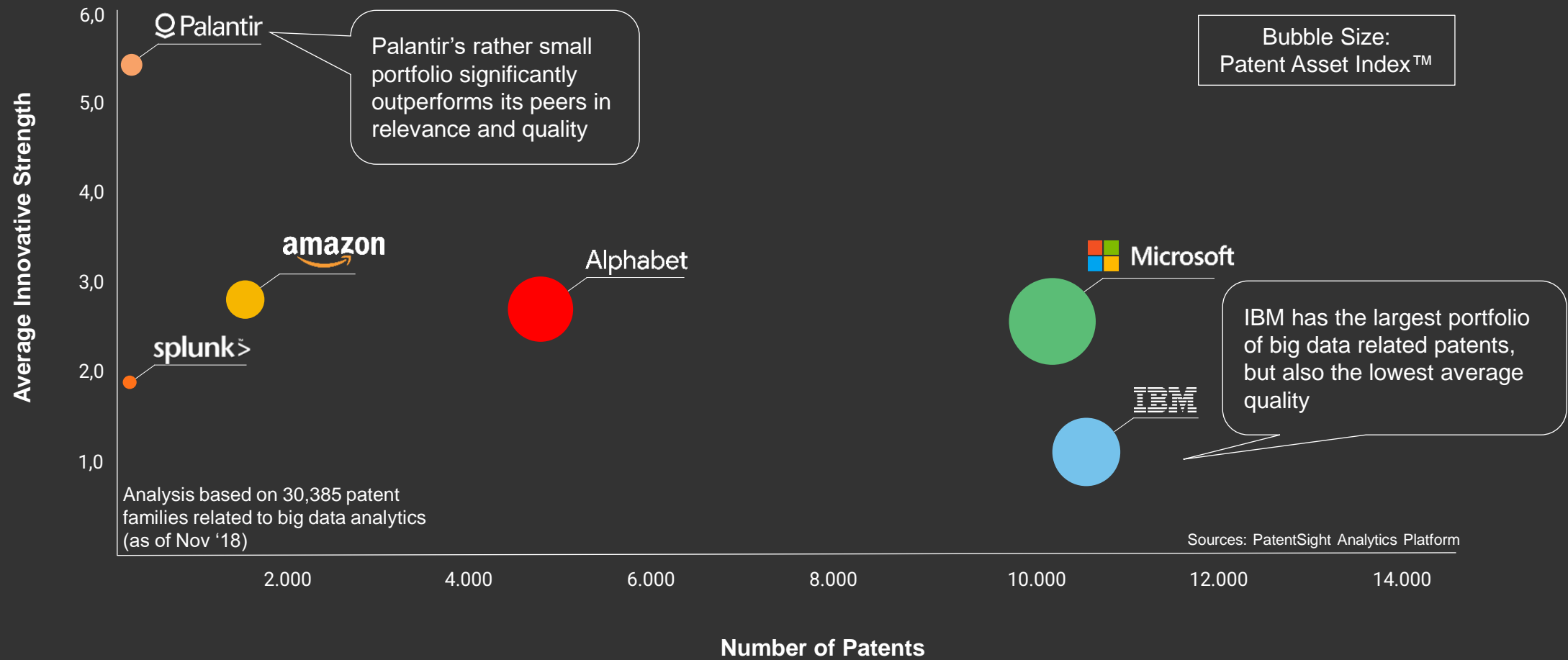
Total R&D Expenditures in 2017

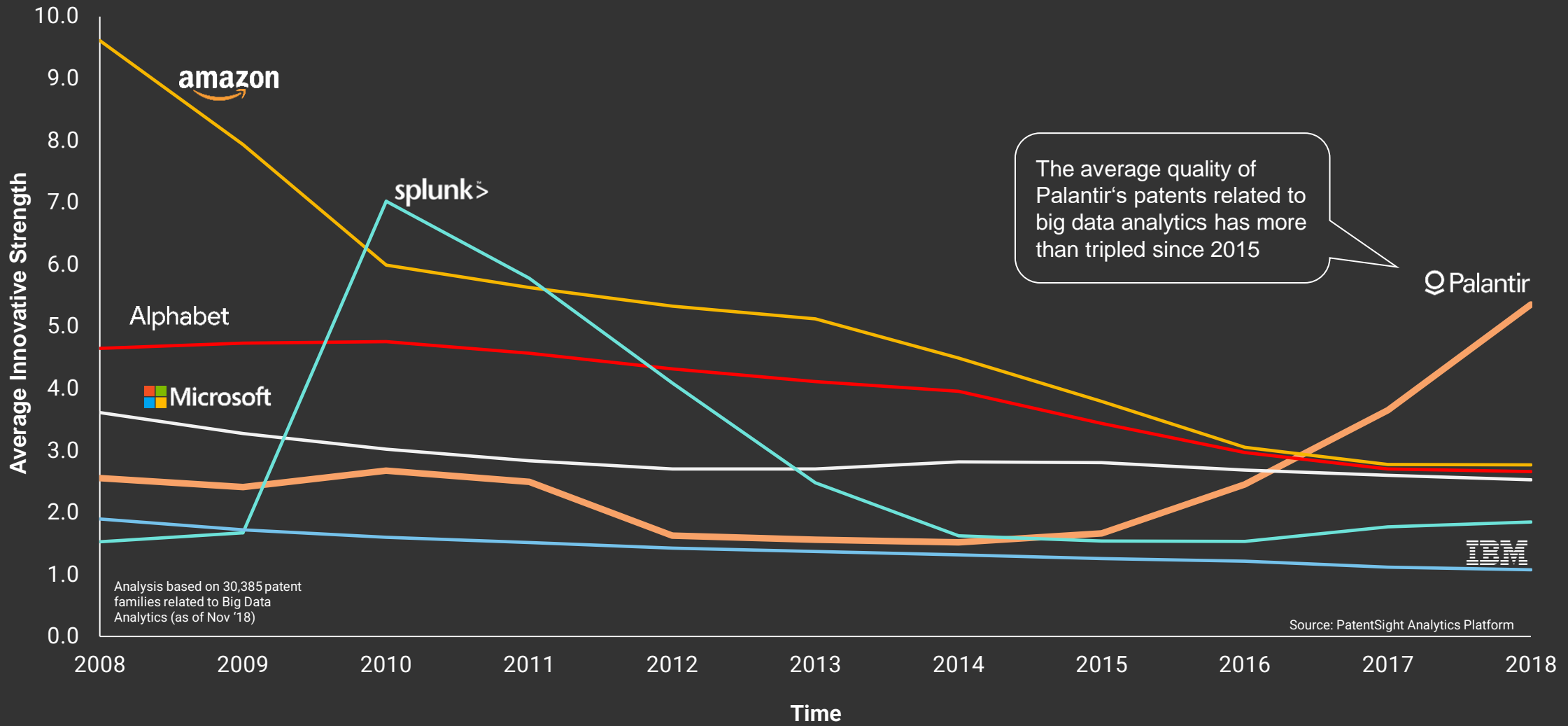


One of the major research areas today:  
**Parkinson & Alzheimer**

- **5.5 million Americans** suffer from Alzheimer's disease (13.8 million by 2050)
- **50,000 Americans** are diagnosed with Parkinson's disease **each year**
- The United States spent **\$259 billion** on health care expenses for Alzheimer's disease in 2017 alone







# Target Search

## Yesterday

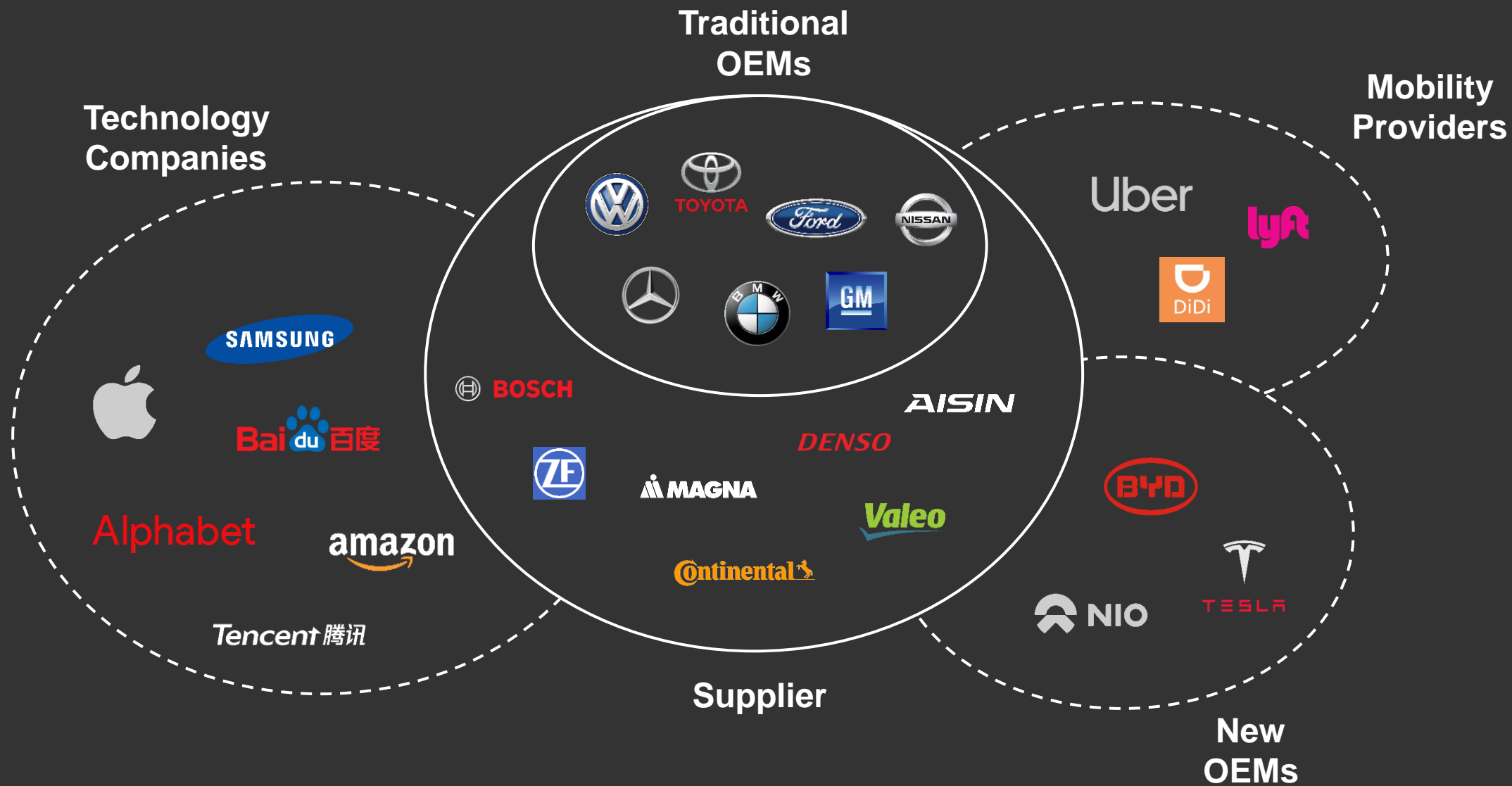
Traditional industries with established value chains

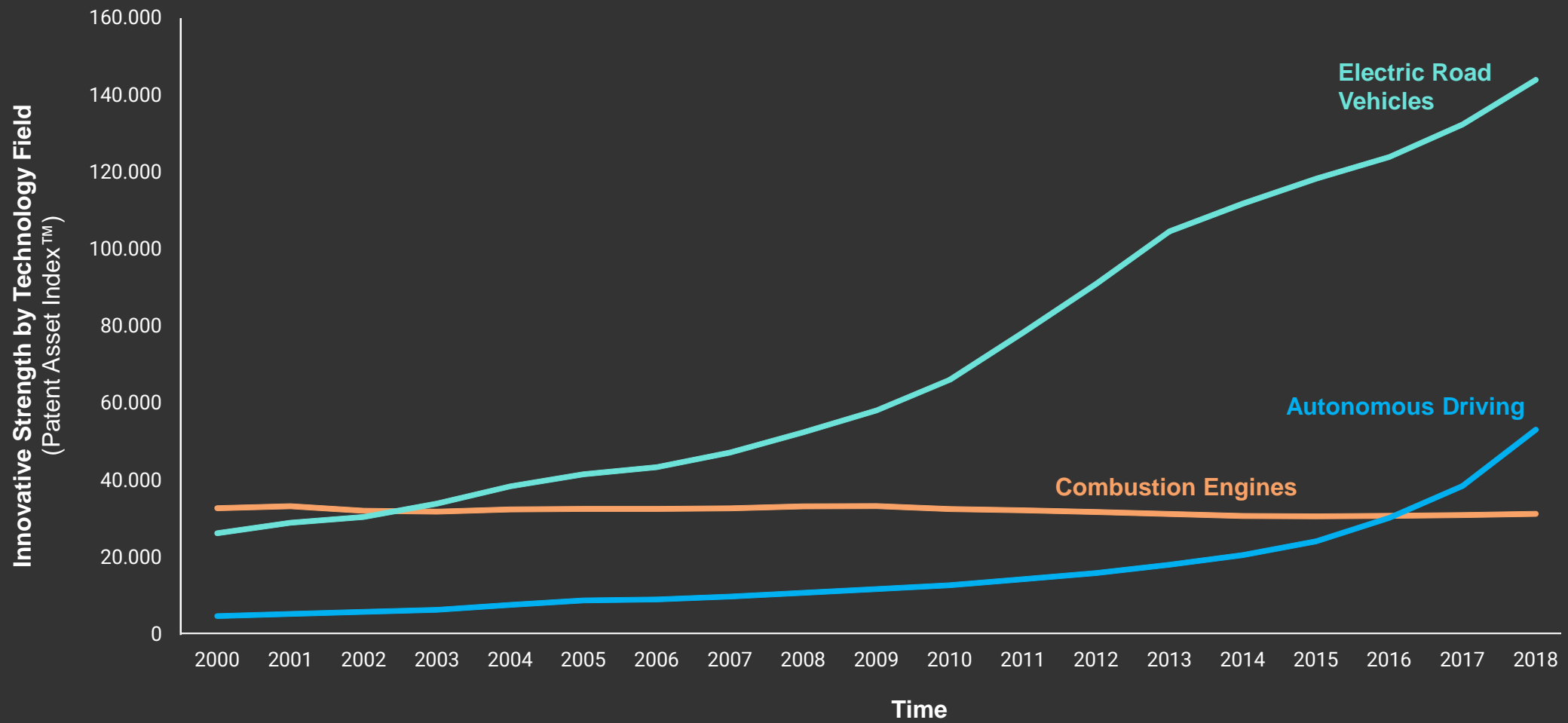


## Today






New globally interconnected ecosystem










Company	Business Area	Revenue (2018)	Number of Patents in Selected Technology	Average Innovative Strength of Patents
 ASI	Autonomous Driving: Vehicle Automation	\$ 29m	49	2.1
 Faraday Future	Electric Vehicles: Motor Technology	\$ 120m	324	1.2
 Lucid Motors	Electric Vehicles: Battery Tech & Luxury Cars	\$ 28m	157	2.6
 PROTERRA	Electric Vehicles: E-Busses	\$ 10m	43	3.5
 ZOOX	Autonomous Driving: Zero-Emission Vehicles	\$ 20m	57	5.3

# ZOOX





 Autonomous Vehicles, Robotics; Zero-Emission Vehicles

 Jesse Levinson, Carl Bass, Aicha Evans

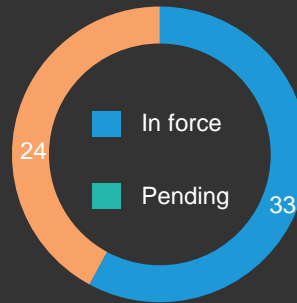
 Silicon Valley, 2014

 420

 Revenue: \$ 20 m (2018)

 Private Company; \$ 790 m total funding

## Patent Portfolio

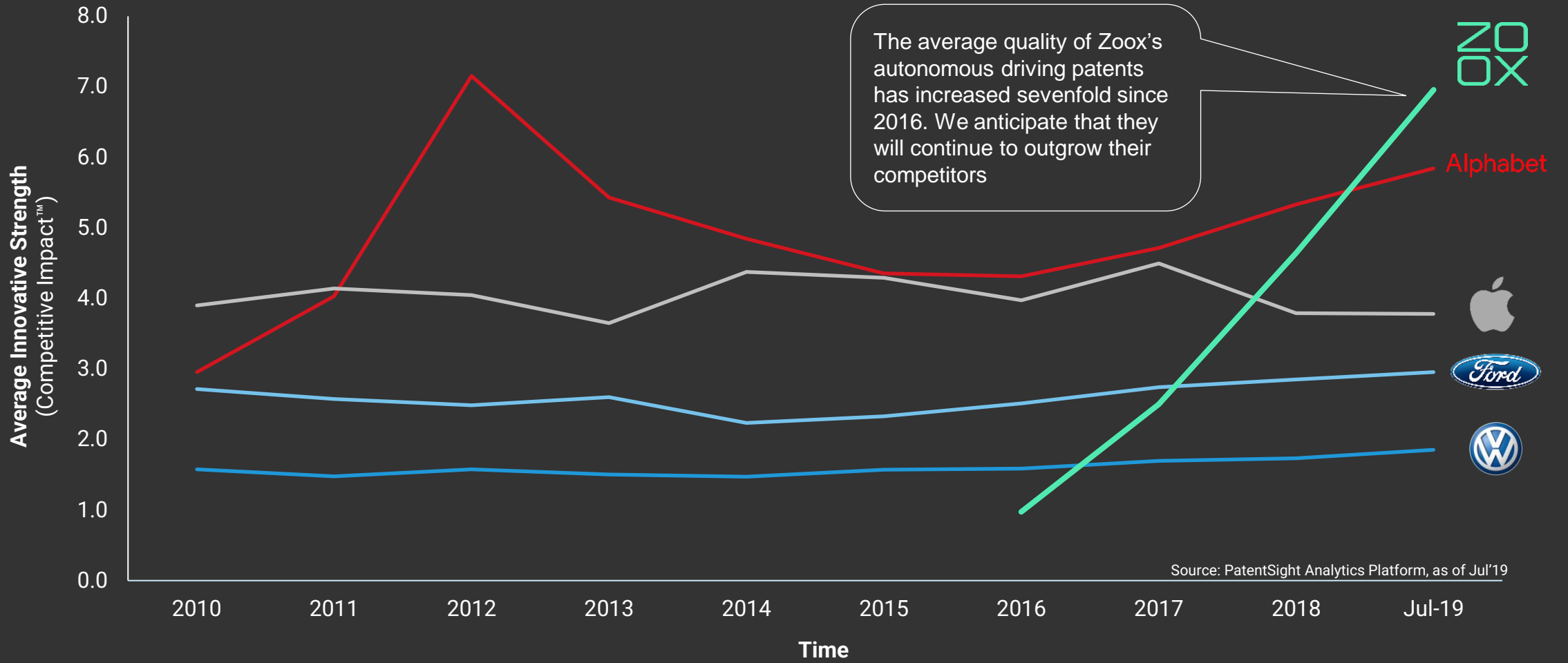


## Recent News

- July 2019 **Zoox Plans to Have Autonomous Cars on the Road by 2020** (Innovation&tech today)
- March 2019 **Zoox can cruise San Francisco without drivers, but now it needs cash** (Automotive News)
- July 2019 **Zoox's self-driving car will provide a smooth ride via independent active suspension (TC)**
- December 2018 **California lets self-driving startup Zoox offer autonomous rides** (Reuters)

## Innovation Peer Group

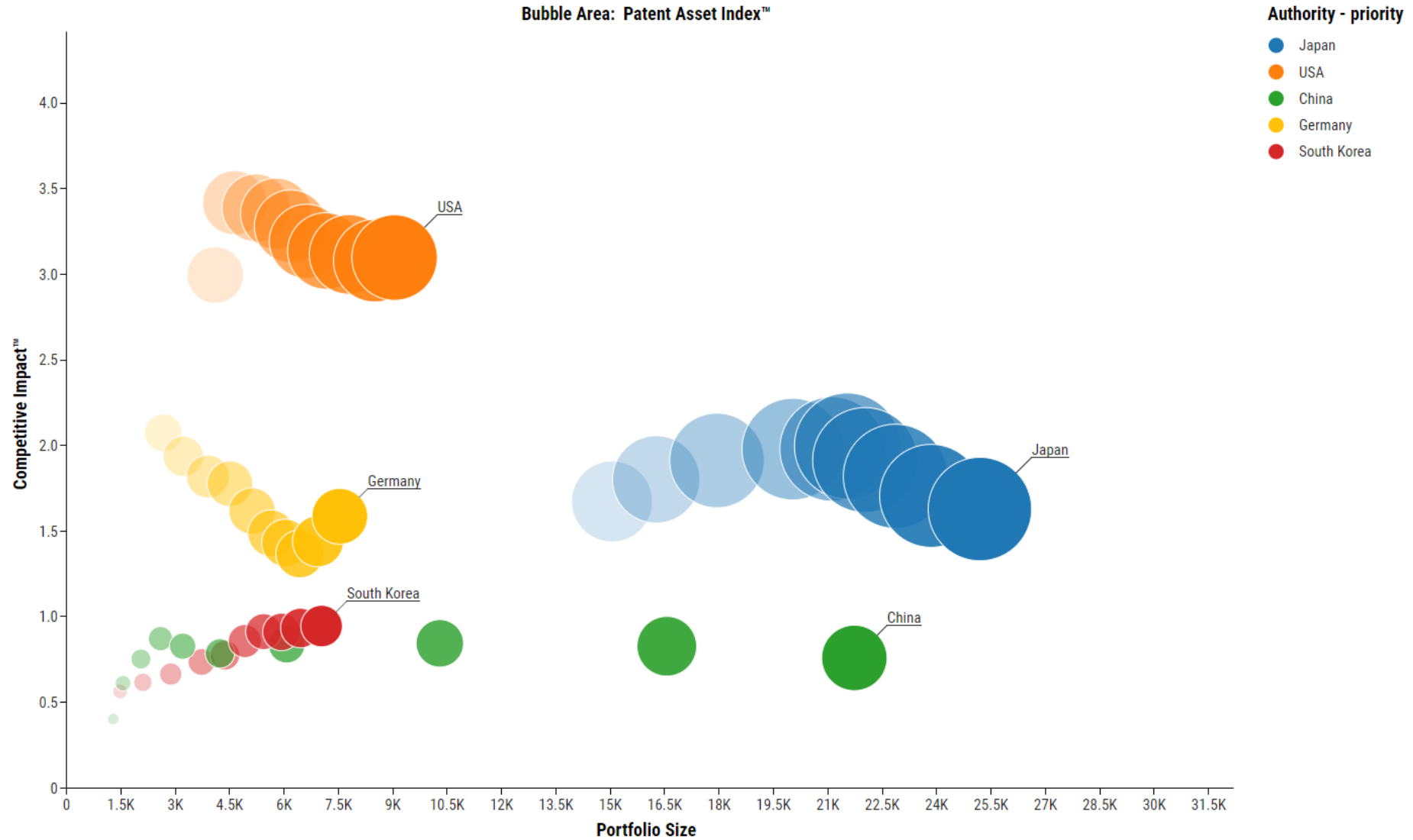




Source: PatentSight Analytics Platform, as of Jul'19

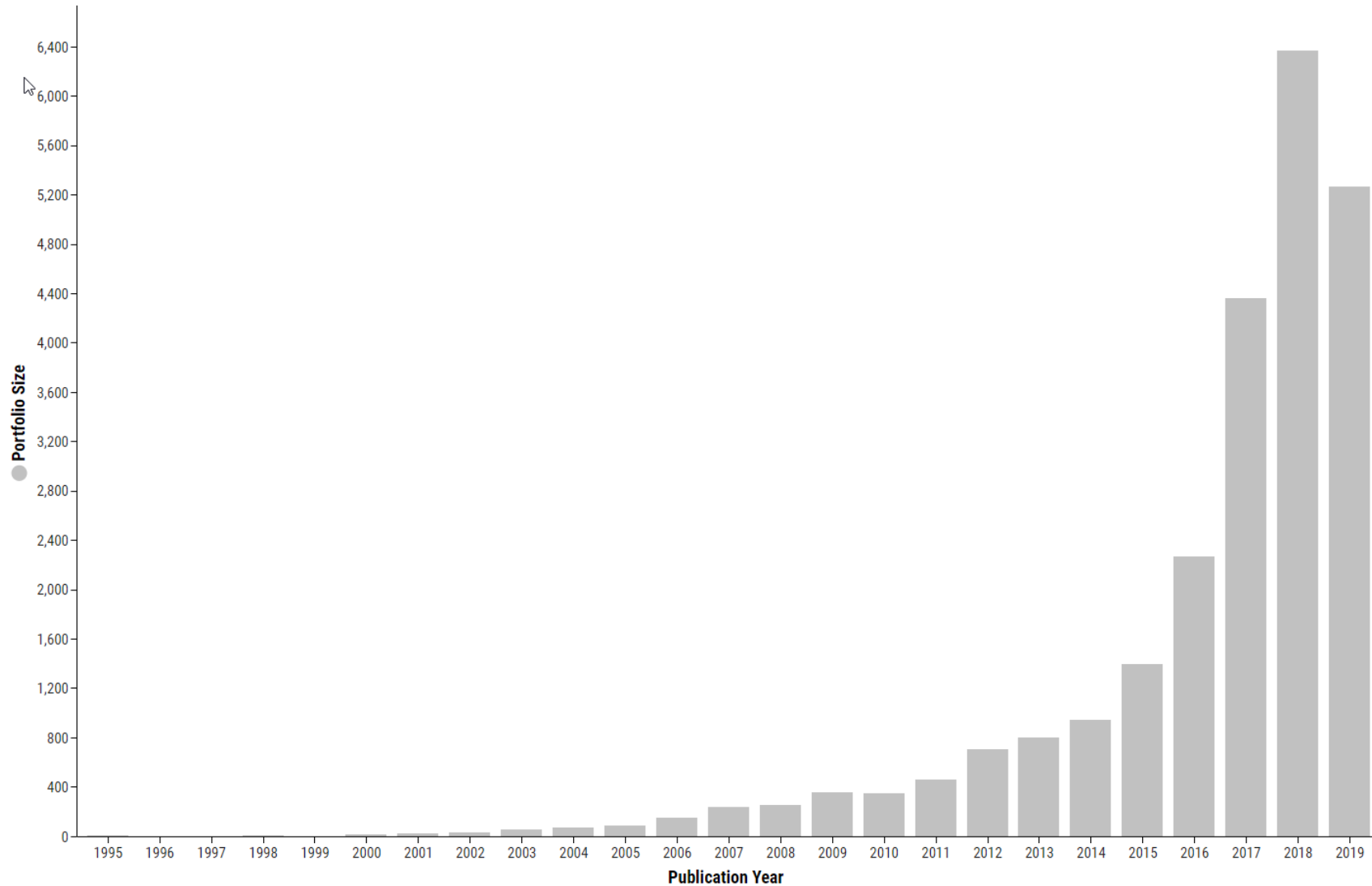
# Analysis of patents on 'e-Mobility' technologies

# 'e-Mobility' – Country Portfolios



Authority - priority (bubbles) shows items 1-5 of 54, sorted by Patent Asset Index™ desc as at 10/3/2019.  
Source: LexisNexis PatentSight 2019

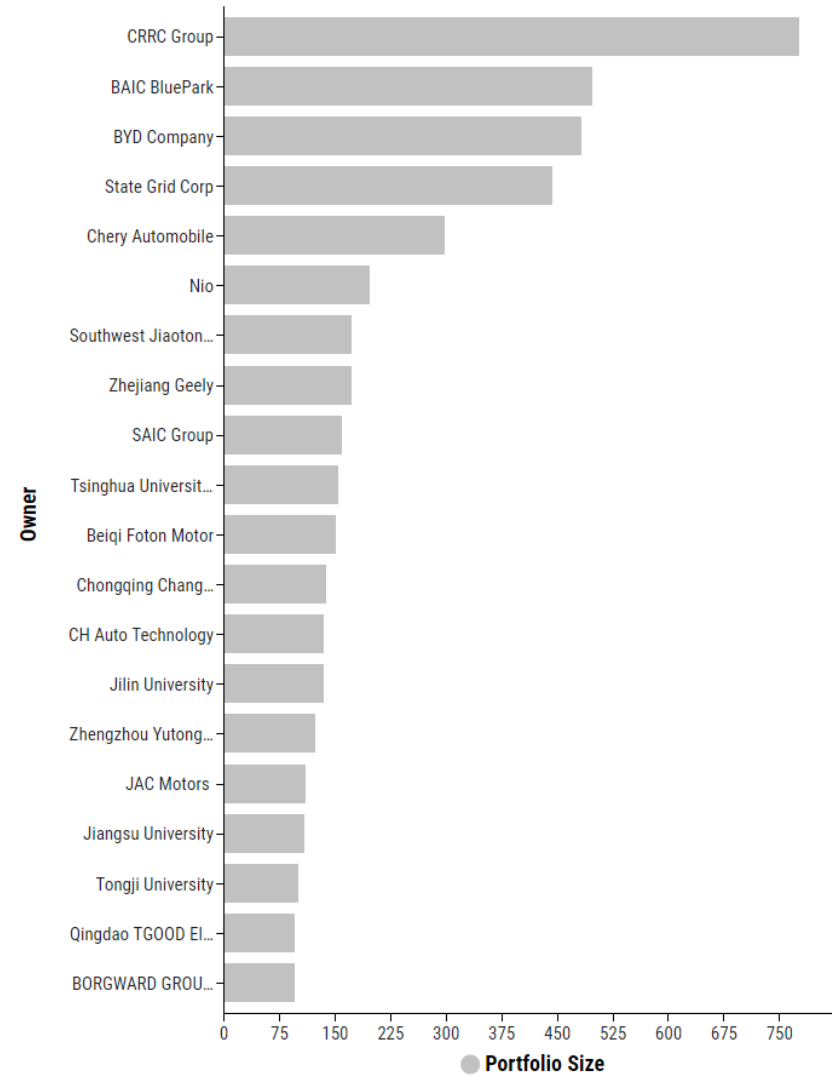
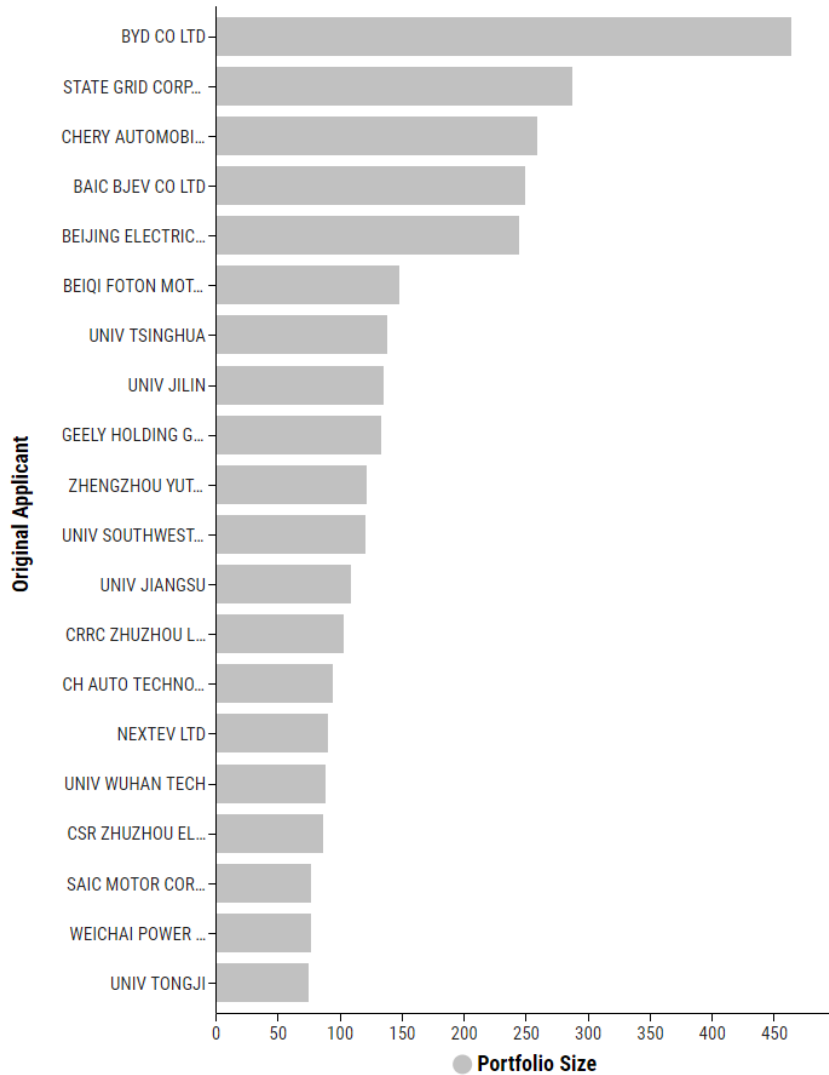
# 'e-Mobility' – Chinese filing trends



Analysis based on 24,442 active and inactive patent families.

Source: LexisNexis PatentSight 2019

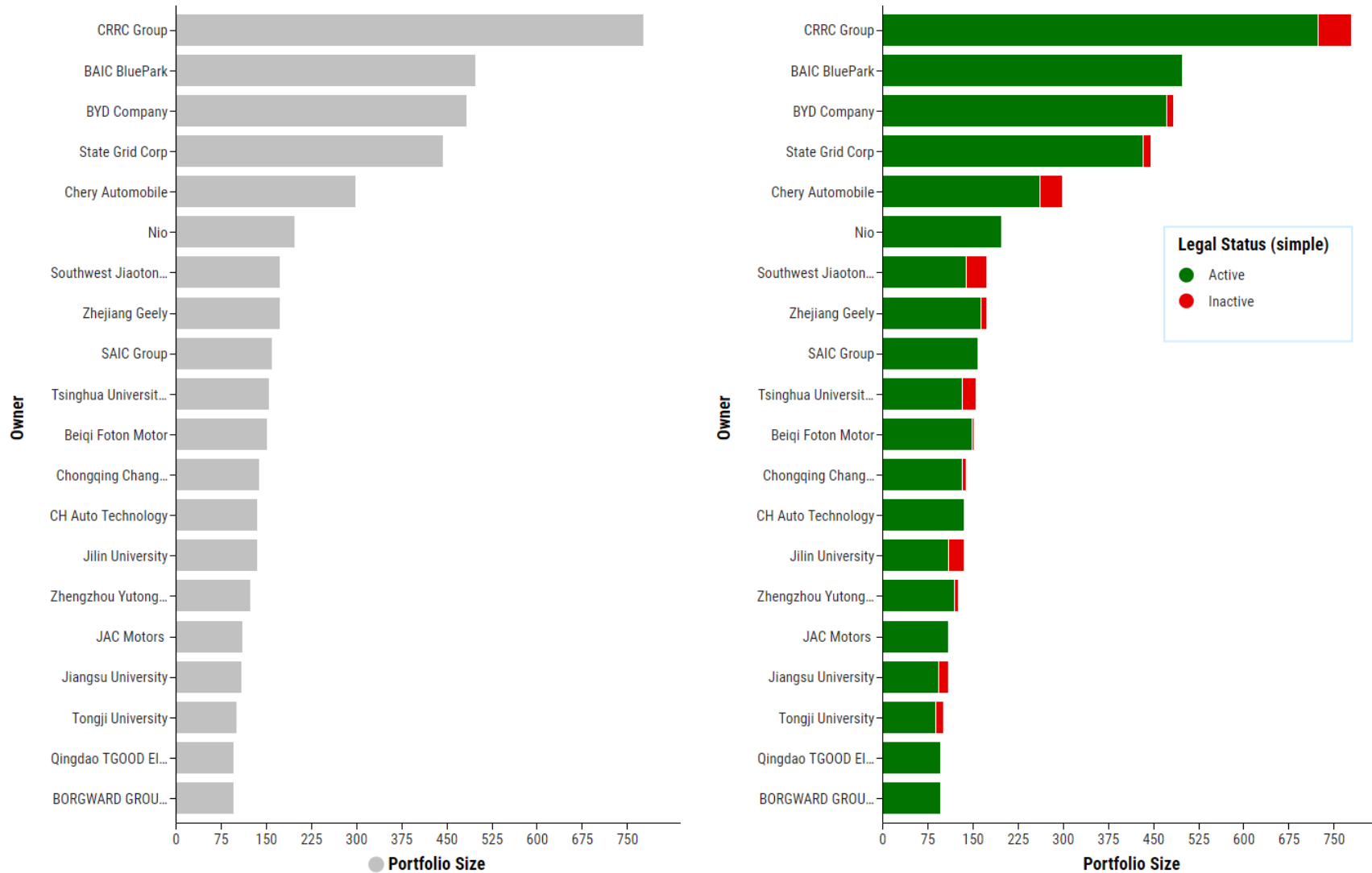
# 'e-Mobility' – Why is Ultimate ownership information important?



Original Applicant (bars) shows items 1-20 of 11431, sorted by Portfolio Size desc.

Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc....(more)

# 'e-Mobility' – Legal Status of Patents



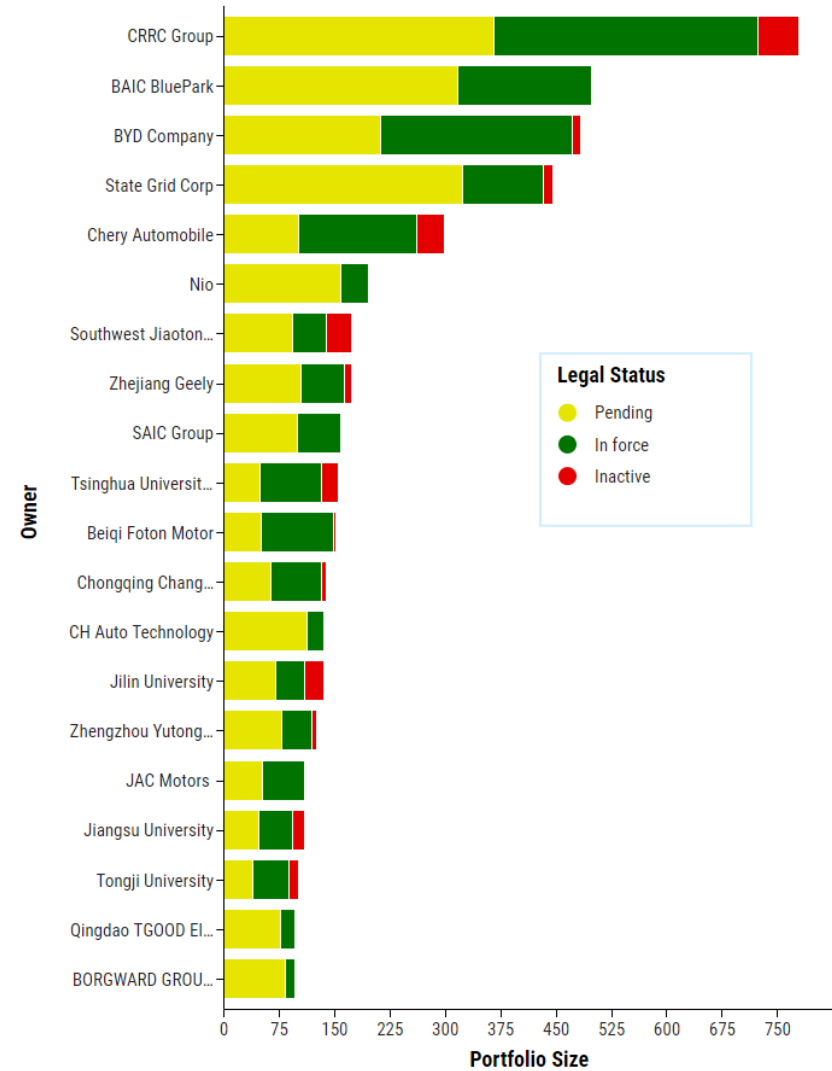
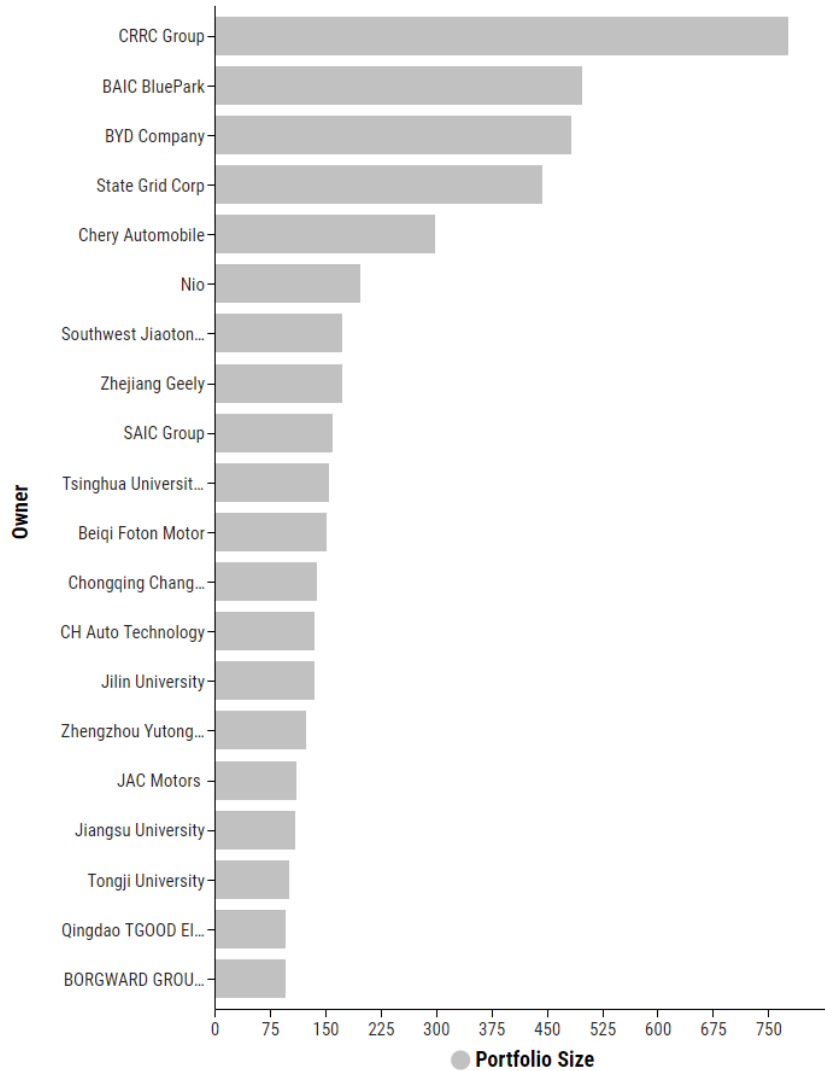
Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc.

Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc....(more)

Analysis based on 24,442 active and inactive patent families....(more)  
Source: LexisNexis PatentSight 2019



# 'e-Mobility' – additional Legal Status information

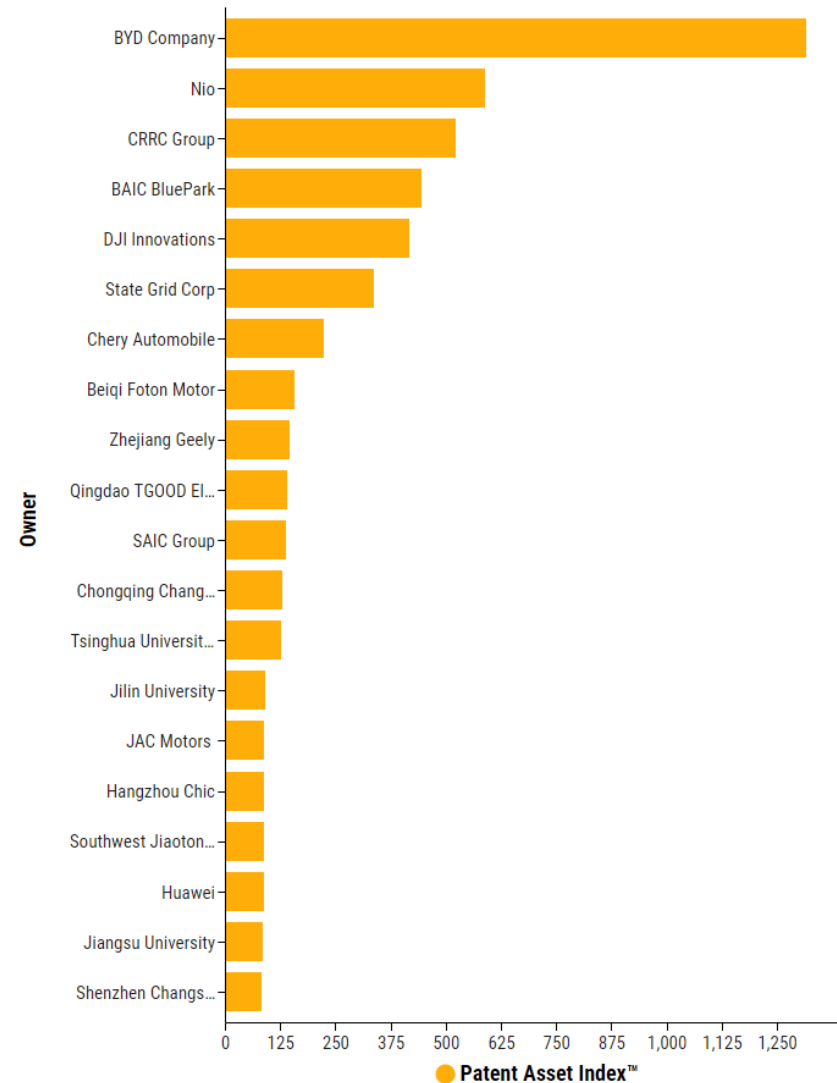
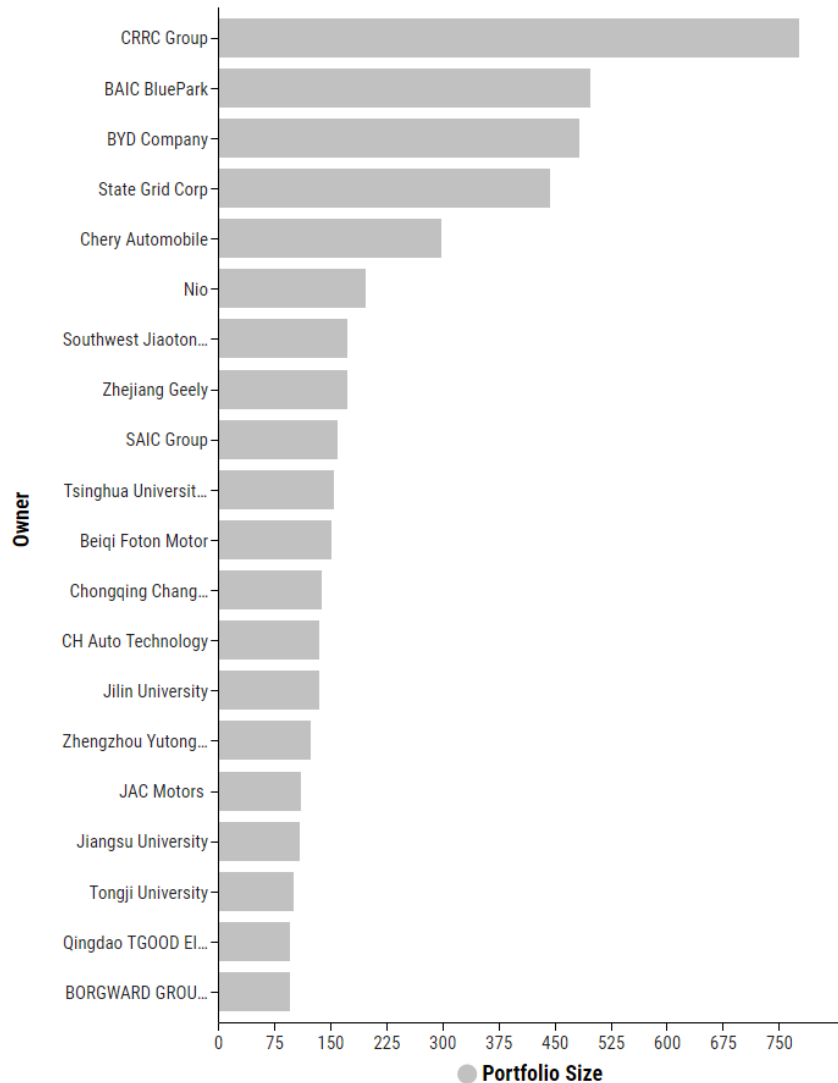


Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc.

Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc....(more)

Analysis based on 24,442 active and inactive patent families....(more)  
Source: LexisNexis PatentSight 2019

# 'e-Mobility' – Portfolio Size vs Portfolio Strength



Owner (bars) shows items 1-20 of 9035, sorted by Portfolio Size desc.

Owner (bars) shows items 1-20 of 9035, sorted by Patent Asset Index™ desc.

Analysis based on 24,442 active and inactive patent families... (more)

Source: LexisNexis PatentSight 2019

# 'e-Mobility' – Main Indicators Table

<input type="checkbox"/>	<input checked="" type="checkbox"/> Owner	Patent Asset Index™	Share in total portfolio strength (PAI) of owner as of ...	Portfolio Size	Competitive Impact™	Technology Relevance™	Market Coverage™
<input type="checkbox"/>	1 BYD Company	1,086	11.7%	419	2.6	1.9	1.3
<input type="checkbox"/>	2 Nio	584	18.3%	193	3.0	1.8	1.7
<input type="checkbox"/>	3 CRRC Group	469	4.5%	667	0.7	0.9	0.7
<input type="checkbox"/>	4 BAIC BluePark	433	30.0%	491	0.9	1.6	0.6
<input type="checkbox"/>	5 DJI Innovations	416	2.8%	25	16.6	6.6	2.4
<input type="checkbox"/>	6 State Grid Corp	334	0.7%	428	0.8	1.4	0.5
<input type="checkbox"/>	7 Chery Automobile	185	5.4%	222	0.8	1.4	0.6
<input type="checkbox"/>	8 Qingdao TGOOD Electric	139	48.7%	93	1.5	2.1	0.6
<input type="checkbox"/>	9 Beiqi Foton Motor	133	8.7%	139	1.0	1.6	0.6
<input type="checkbox"/>	10 Chongqing Changan Automobile	109	6.8%	110	1.0	1.8	0.5
<input type="checkbox"/>	11 Zhejiang Geely	106	2.2%	138	0.8	1.3	0.6
<input type="checkbox"/>	12 Tsinghua University (China)	102	0.4%	110	0.9	1.3	0.7
<input type="checkbox"/>	13 SAIC Group	94	2.5%	132	0.7	1.1	0.5
<input type="checkbox"/>	14 Hangzhou Chic	87	45.3%	5	17.5	5.9	2.0
<input type="checkbox"/>	15 Jilin University	85	1.3%	102	0.8	1.5	0.6
<input type="checkbox"/>	16 Shenzhen Changshengxin Tech.	82	84.0%	19	4.3	7.7	0.5
<input type="checkbox"/>	17 CATL	82	5.2%	48	1.7	1.4	1.2
<input type="checkbox"/>	18 JAC Motors	78	2.5%	97	0.8	1.4	0.6
<input type="checkbox"/>	19 Huawei	77	0.1%	36	2.1	1.2	1.5
<input type="checkbox"/>	20 CH Auto Technology	76	17.1%	126	0.6	1.2	0.5
<input type="checkbox"/>	21 Zhengzhou Yutong Bus	76	15.6%	107	0.7	1.0	0.7
<input type="checkbox"/>	22 Jiangsu University	73	1.0%	83	0.9	1.6	0.5
<input type="checkbox"/>	23 Aulton New Energy	73	39.1%	13	5.6	2.3	2.1
<input type="checkbox"/>	24 Xiaomi	72	0.3%	19	3.8	1.9	1.5
<input type="checkbox"/>	25 Southwest Jiaotong University	67	2.1%	119	0.6	1.1	0.6
<input type="checkbox"/>	26 Foshan Mofan Auto. Access.	66	84.8%	18	3.7	6.4	0.5
<input type="checkbox"/>	27 Guangzhou Shuangdao Tech.	66	92.1%	15	4.4	7.4	0.5
<input type="checkbox"/>	28 Shenzhen Haidun Hardware	60	92.2%	11	5.5	9.3	0.5
<input type="checkbox"/>	29 Wuhan University of Technology	59	1.1%	69	0.9	1.7	0.5
<input type="checkbox"/>	30 SHENZHEN OPTIMUM BATTERY C...	54	14.7%	72	0.7	1.2	0.6

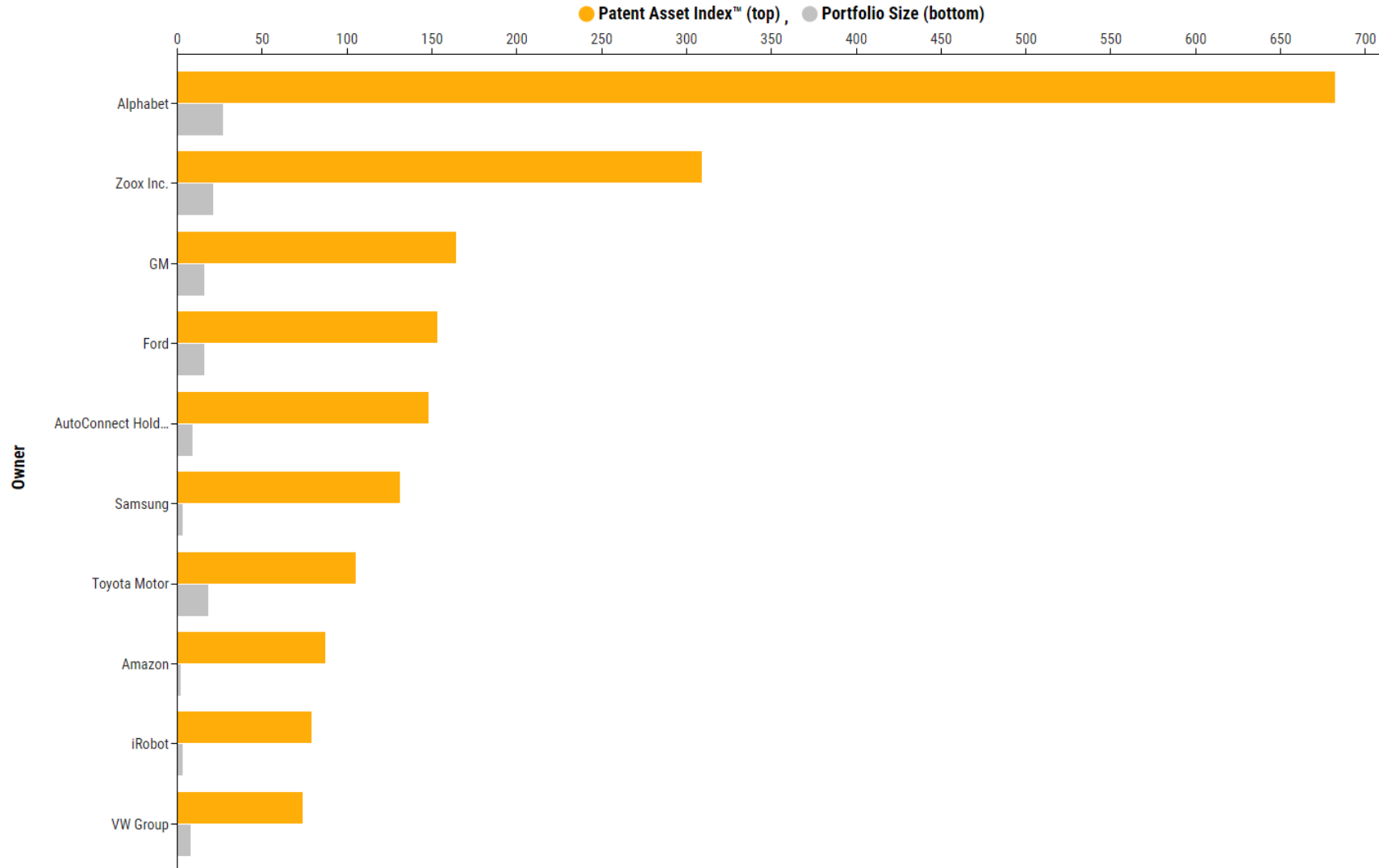
Source: LexisNexis PatentSight 2019

# 'e-Mobility' – Benchmarking Table

✓ IPC	Patent Asset Index™	Portfolio Size	Competitive Impact™	Technology Relevance™	Market Coverage™
1 B60S 5: Servicing, maintaining, repairing, or refitting of vehicles (vehicles adapted to c...	629	144	4.4	2.4	1.8
2 B60L 11: Electric propulsion with power supplied within the vehicle	504	152	3.3	1.9	1.8
3 H02J 7: Circuit arrangements for charging or depolarising batteries or for supplying lo...	474	134	3.5	1.9	1.9
4 H01M 10: Secondary cells; Manufacture thereof	240	76	3.2	2.1	1.5
5 H01M 2: Constructional details, or processes of manufacture, of the non-active parts	214	58	3.7	2.2	1.8
6 B60K 1: Arrangement or mounting of electrical propulsion units (takes precedence) (ar...	202	47	4.3	2.0	2.2
7 B60L 53: Methods of charging batteries, specially adapted for electric vehicles; Chargin...	171	70	2.4	1.9	1.4
8 H04L 29: Arrangements, apparatus, circuits or systems, not covered by a single one of ...	165	52	3.2	1.8	1.8
9 B60R 16: Electric or fluid circuits specially adapted for vehicles and not otherwise provi...	159	50	3.2	1.9	1.6
10 G06K 9: Methods or arrangements for reading or recognising printed or written charact...	125	44	2.8	1.9	1.5
11 G06F 3: Input arrangements for transferring data to be processed into a form capabl...	124	33	3.7	2.0	1.8
12 G05D 1: Control of position, course, altitude, or attitude of land, water, air, or space veh...	114	32	3.5	2.1	1.7
13 B60W 30: Purposes of road vehicle drive control systems not related to the control of a...	113	33	3.4	2.0	1.8
14 B62D 25: Superstructure sub-units; Parts or details thereof not otherwise provided for	113	24	4.7	2.2	2.2
15 G08G 1: Traffic control systems for road vehicles (arrangement of road signs or traffic ...	113	35	3.2	2.0	1.6
16 G06Q 10: Administration; Management	113	51	2.2	1.9	1.1
17 B60W 40: Estimation or calculation of driving parameters for road vehicle drive control ...	98	30	3.3	2.0	1.7
18 G01R 31: Arrangements for testing electric properties; Arrangements for locating electr...	97	29	3.3	2.0	1.7
19 G01C 21: Navigation; Navigational instruments not provided for in groups	97	33	2.9	2.3	1.5
20 G06Q 50: Systems or methods specially adapted for specific business sectors, e.g. Uti...	95	38	2.5	1.9	1.2
21 H01R 13: Details of coupling devices of the kinds covered by groups or	85	29	2.9	2.1	1.3
22 B60L 3: Electric devices on electrically-propelled vehicles for safety purposes; Monitori...	84	28	3.0	2.1	1.6
23 B23P 19: Machines for simply fitting together or separating metal parts or objects, or m...	76	19	4.0	2.1	1.9
24 B60H 1: Heating, cooling or ventilating devices (heating, cooling or ventilating devices ...	73	25	2.9	2.1	1.4
25 H02K 1: Details of the magnetic circuit (magnetic circuits for relays)	70	14	5.0	2.6	1.9
26 H04W 4: Services specially adapted for wireless communication networks; Facilities th...	66	21	3.1	1.8	1.7
27 B60R 1: Optical viewing arrangements (antiglare equipment, e.g. polarising, for windsc...	66	19	3.5	2.0	1.8
28 B60W 50: Details of control systems for road vehicle drive control not related to the co...	62	18	3.4	2.0	1.7
29 B60N 2: Seats specially adapted for vehicles; Arrangement or mounting of seats in veh...	61	21	2.9	2.0	1.5
30 B60L 15: Methods, circuits or devices for controlling the propulsion of electrically-prop...	61	19	3.2	1.8	1.9
31 G06F 17: Digital computing or data processing equipment or methods, specially adapte...	57	21	2.7	1.9	1.4
32 B62D 21: Understructures, i.e. chassis frame on which a vehicle body may be mounted ...	56	10	5.6	2.1	2.7
33 G07C 5: Registering or indicating the working of vehicles (for measuring distance trave...	54	13	4.1	2.6	1.7
34 B60R 25: Fittings or systems for preventing or indicating unauthorised use or theft of v...	54	15	3.6	1.9	1.7
35 G06Q 30: Commerce, e.g. shopping or e-commerce	51	17	3.0	2.0	1.4
36 B60L 58: Methods or circuit arrangements for monitoring or controlling batteries or fue...	46	16	2.9	2.0	1.5

Source: LexisNexis PatentSight 2019

# 'e-Mobility' – Corporate Portfolio Strength



Owner (bars) shows items 1-10 of 122, sorted by Patent Asset Index™ desc as at 10/3/2019.

Analysis based on 268 patent families active at 10/3/2019....(more)

Source: LexisNexis PatentSight 2019

# 'e-Mobility' – Patent Document view

Highlight keywords... Select Sorted by: CI ↓

- Unmanned air vehicle interoperability agent** 2005  
 A method to provide a nominal best effort data rate based on ...  
 Lenovo - AMITAVA GHOSH, CORMAN DAVID et al. EP1941334.A1
- Configuration of v2v and v2i radio communication in radi...** 2015  
 There are provided measures for configuration of radio comm...  
 Nokia - KOVACS ISTVAN ZSOLT and SORET BEA... EP3345173.A1
- Automatic working system, charging station and method ...** 2016  
 The present invention relates to an automatic working system...  
 Positec Power Tools (Suzhou) - DU JIANG, JIAN... EP3354124.A1

### Family of EP1941334.A1 et al.

**Unmanned air vehicle interoperability agent**

A method to provide a nominal best effort data rate based on a Quality of Service (QoS) requirement of a user data connection, the method comprising assigning ( 105 ) a service priority based on the QoS requirement, and assigning ( 110 ) the nominal best effort data rate for the service priority using a predetermined function. Further, it comprises of a method to determine a scheduling priority value for a user data connection by providing a relative fairness. Furthermore, the method comprises a method to satisfy a delay requirement for a delay sensitive data connection through a scheduling. (Source: EP1941334.A1, equivalent)

**Inventors** Amitava Ghosh, Corman David E, Dorris Steven A, Fan Wang, Herm Thomas S, Marten, ...  
**Applicants** Boeing Co, Corman David E, Dorris Steven A, Ghosh Amitava, Herm Thomas S, Marte, ...

**Lenovo**

First filing in family 9/26/2005  
 First publication in family 3/29/2007

**Family members (22)**

Document #	Title	Publication date
EP1941334.A1	Unmanned air vehicle interoperability agent	7/9/2008
AT487970.T	Interoperability agent for unmanned aircraft	11/15/2010
CN101273586.A	Method to determine a scheduling priority value for a user data connection based on a qua...	9/24/2008
DE112006002491.T5	Method for determining a scheduling priority level for a user data connection based on a Q...	7/10/2008
DE602006018177.D1	Interoperability agent for unmanned aircraft	12/23/2010

**Indicators**

Competitive Impact™ (CI)	6.3	In force	DE, FR, GB, US
Market Coverage™ (MC)	1.5	Pending	-
Technology Relevance™ (TR)	4.3	Inactive	AT, BE, BG, CH, CN, CY, CZ, DK, EE, EP, ES, FI, GR, HU, IE, IS, IT, LI, LT, LU, LV, ...

**Prior art (52)**

	Filed	PAI
Ericsson	1996-2004	25.5
L3Harris	2004	21.5
Citrix	2002	8.6
Philips	2005	5.7
NTT	2002	5.4

**Subsequent art (67)**

	Filed	PAI
Qualcomm	2003-2015	88.1
XIDRONE SYSTEMS	2015-2016	25.5
DEPARTMENT 13 LLC	2016	20.2
Ribbon Communications	2010-2011	14.0
Dell Technologies	2006-2007	0.1

**IPC**

B64C 13/00	H04L 1/00
19/00	12/26
F41G 7/22	.../56
G05D 1/00	29/06
G06F 15/16	.../08

**CPC F-Term**

H04L 1/00	H04L 69/08
12/56	H04W 72/1221
43/00	.../1236
49/90	.../1242
67/125	

# Thank you.

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53227 Bonn, Germany