

# Empowering the Future.

“The EV Combat”  
2020

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# “The EV Combat”

Oil & Gas Vs Utilities Vs Automakers

## “The EV Combat” | Big Oil, Utilities and Automakers in a EV war

Big Oil and Large Utility companies, as most recently AutoOEM's, are starting an “EV Combat” by massively announcing public charging networks and investments in pure play EV companies

Hyperdrive

# Big Oil, Utilities are Lining Up for an Electric Vehicle War

By Kelly Gilblom and Anna Hirtenstein

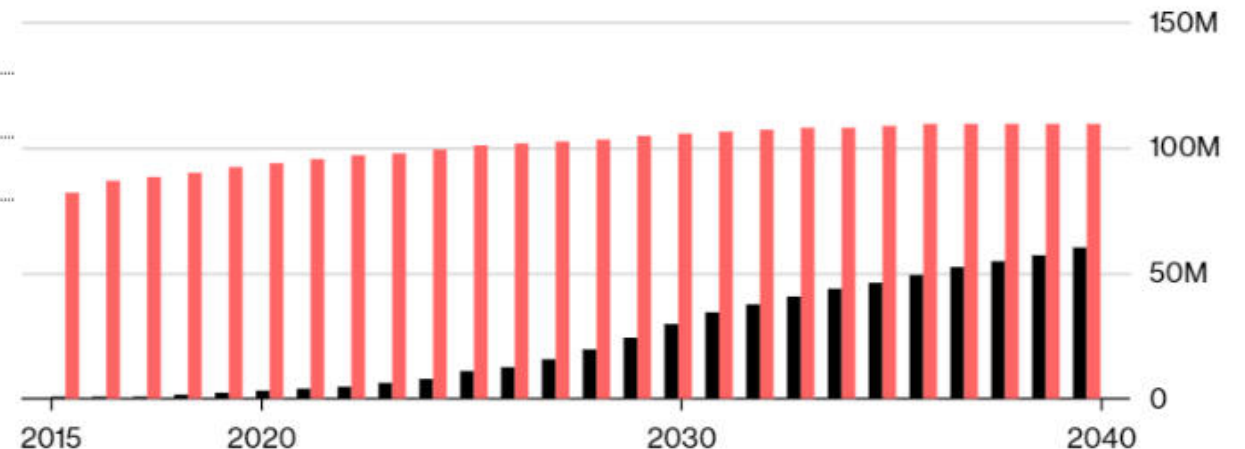
2 de julho de 2018, 05:00 WEST

- ▶ BP and Shell have bought electric-car charging companies
- ▶ Power utilities are boosting sales to homes, chargers on roads

### Power Move

Electric vehicles will make up an increasing portion of light-duty vehicle sales

■ Electric vehicle sales ■ Total vehicle sales



Source: Bloomberg New Energy Finance

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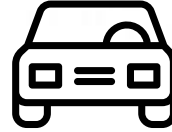
**Selected public EV charging networks in Europe**

Name	Type	Main Countries	Public charging outlets in Europe	Dominant power rating of assets
Shell (NewMotion)	Oil major	Germany, UK, France, Belgium, Austria	64,000	3-43kW
Engie (EVBox)	Utility	France, Germany, Netherlands	~20,000	3-43kW
Allego	Pure-play	Netherlands, Belgium, Germany	8,000	3-43kW
Vattenfall	Utility	Germany, Sweden, Netherlands	8,800	22-50kW
BP (Chargemaster/ Polar)	Oil major	UK	6,500	3-50kW
Eon	Utility	Germany	4,000	3-40kW
Fortum	Utility	Norway, Sweden, Finland	~2,000	3-50kW
Innogy	Utility	Germany	4,600	3-50kW
Enel/E-via Flex-e	Utility	Italy	~2,000	3-20kW
FastNed	Pure play	Netherlands, Germany	<500	>43kW
Tesla	Auto-OEM	EU-28	~1,800	120-140kW
Ionity	Auto-OEM	Germany, Belgium, France, UK, Netherlands	~120*	350kW



## “The EV Combat” | Big Oil, Utilities and Automakers in a EV war

Big Oil and Large Utility companies, as most recently AutoOEM's, are starting an “EV Combat” by massively announcing public charging networks and investments in pure play EV companies



### Automakers' Drivers

- Electrification & Decarbonisation forces
- Maintain Competitive position in Mobility
- New Business Models



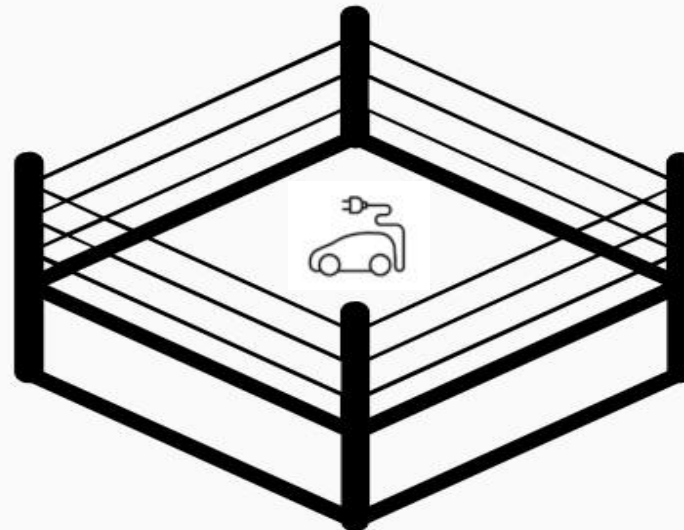
### Oil & Gas Drivers

- Decarbonisation Path
- Electricity Retail
- Cash 'horsepower'
- Sustainability
- Green Energies Investment



### Utilities' Drivers

- Digitalization
- Innovation
- Client retention
- New Business Models
- Energy Efficiency



## The EV Arena

## “The EV Combat” | Market Opportunities

The current main projects within Electric Mobility are focused on fast & public networks, although it appears home or work charging are not yet being addressed with the same urgency. Some market opportunities arise.

- ✓ The fact that Oil&Gas companies are investing in pure-plays, energy retailers and fully-entering in the electricity business, is a strong market signal. Along with traditional efficiency programs and financial discipline, they are increasingly taking a decarbonisation and green energies path
- ✓ Utilities feel the need to *defend* their backyard as new players enter the electricity business (their traditional business). Time-to-market will be crucial for Utilities that are now developing their integrated offer for providing charging at home and workplace.
- ✓ Automakers are also making their way into the market by investing in charging networks (direct or indirect, such as e-roaming agreements) and also in developing their own energy services companies and platforms.
- ✓ This creates a **market opportunity** for pureplay companies or other EVSE within the electric mobility ecosystem. Some examples of **specific solutions** that could be game changers, for the private market:
  - Demand-Response
  - Storage
  - Vehicle-to-grid / Vehicle-to-home
  - Dynamic load management

## “The EV Combat” | Electric Mobility Ecosystem


Whether its through JV's, M&A activity, Open Innovation programs or simply commercial partnerships, Big Oil and Large Utility companies are partnering with experts from several domains of the Electric Mobility Ecosystem

### EVSE Suppliers

BP acquired  (**chargemaster**) (£130M\*), the largest public, workplace and home charging units supplier in the UK (largest network)  **POLAR**

Shell acquired **newmotion** in 2017, which is a large provider of smart charging solutions for Evs


### EV Charging Networks

Shell **Recharge** network: Partnership with  **allego** to install fast charging devices (50-150 kW) to selected Shell stations in the UK, Netherlands, Germany and China



Repsol operates a network under the  brand

Cepsa, Shell, Enel X and other majors partnered with **IONITY** to install several ultra-fast chargers (350 kW) across Europe

### Startups & Innovation

BP invested \$20 million investment in an ultra-fast charging battery start-up company called  **StoreDot**


EDP developed **re:dy** an app that allows the consumer to control its home generation & consumptions (EV included)


 Enel X bought a Silicon Valley startup called  **eMotorWerks** that developed JuiceNet, an EV charging platform

\* (not confirmed figures)

### New Business Models

EDP partnered with  **efacec** to develop and provide a technological solution for shared condominiums and car parks

Engie and  **ARVAL** just announced the launch of a new green transport offer with a monthly rental fee, EV leasing from Arval and the installation and maintenance by ENGIE

 **HUBJECT** Connects EV charging infrastructure with an e-roaming platform



“The EV Combat” | Electric Mobility Ecosystem  
Business Models Benchmarking (1/2)

BUSINESS MODELS

BM #1

Operate public charging stations thanks to authentication methods and simple platform and bills consumers for their use

CPO Direct revenues

BM #2

Operate public charging stations and use them in order to attract consumers to retail locations and promote brands

CPO - Indirect revenues

BM #3

Aggregate CPO's to maximize network coverage and unified authentication methods

Sinergies / Smart Platform Dev.

BM #4

Use data generated by public and semi-public charging to develop smart software and advisory services

Smart Charging Services

BM #5







Optimize energy production and distribution, through data collection and software dev. to develop end-to-end energy offers

Digital energy offer

PLAYERS



“The EV Combat” | Electric Mobility Ecosystem  
Business Models Benchmarking (2/2)

BUSINESS MODELS	BM #6	BM #7	BM #8	BM #9	BM #10
	Optimize load management, energy production and distribution thanks to data collection and software dev. For end-to-end energy offer	Offer smart services packages to customers purchasing/renting an EV enabling them to reap full benefits of new mobility	Develop, manage public services through concessions granted by local authorities with potential transfer after given period	Design and produce chargers that match both regulatory standards and customer needs	Offer a seamless charging offer and cover everyday life  Typical BM for EV charging Pure players or new models such as e-roaming
	End-to-end Energy	Bundled vehicle and charging	PPP w/ potential transfer (Build, Own, Operate)	EVSE Solutions provider	Charging-as-a-service
					 
	PLAYERS				

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# “The EV Combat”

E-Mobility Business Models



# "The EV Combat" | Electric Mobility Ecosystem

## Shell - Market Approach



### EVSE Suppliers

Shell acquired **newmotion** in 2017.

Newmotion provides smart charging solutions (up to 22kW) for businesses and drivers at work, home and on the go.

Newmotion has installed more than 52.200 charging points across Europe.



### EV Charging Networks

**newmotion** is the owner of one of Europe's largest EV charging networks, providing access to a roaming network of more than 125,000 charging points.

**Shell Recharge** network: Partnership with **allego** to bring fast charging capability (50-150 kW) to selected Shell service stations in the UK, Germany, Netherlands and China.

Acquisition of **greenlots**, an US-based provider of EV charging and energy management software and solutions.

### Startups & Innovation

Shell Ventures invested in **ample**, a start-up that aims to solve the energy delivery challenge for electric transportation.

Shell Ventures invested in **AURORA**, an AV car start-up, with Amazon also participating in financing round.

**sonnen** Energy storage systems and energy services for households.



### Partnerships

**IONITY** Shell will install 500 IONITY ultra-fast chargers (350kW).



Shell and Nissan's Formula-E team partnership.

Partnership with Mitsubishi, TenneT, ENGIE, Hitachi and ENEL in V2G/V2X.

**DAIMLER** & **newmotion** to offer fleet charging solutions.

# “The EV Combat” | Electric Mobility Ecosystem

## BP - Market Approach



### EVSE Suppliers

BP acquired **bpchargemaster** for £130m.

BP Chargemaster is the largest supplier of public, workplace and home charging units in the UK and has supplied over 50,000 charging points across Europe.



### EV Charging Networks

BP Chargemaster operates the UK's largest EV charging network: **POLAR** with more than 7.000 charging points.

BP Chargemaster plans to have 400 HP charging points in the UK by 2021.

BP & **DiDi** launch a charging joint venture for setting up a nationwide network in China.

### Startups & Innovation

**StoreDot** \$20 million investment in an ultra-fast-charging battery start-up company.



\$5 million investment in a developer of mobile electric vehicle charging systems – **Mobi Chargers**.

BP acquired **PowerShare**, a chinese charging network/platform.



### Partnerships

Collaboration with the Renault-Nissan-Mitsubishi alliance for a joint development of advanced mobility solutions.

MoU with **NIO** to establish a long-term partnership to jointly explore opportunities in advanced mobility in China and internationally.



# “The EV Combat” | Electric Mobility Ecosystem

## Total - Market Approach



### EVSE Suppliers

Total acquired , a smart charging solutions provider (GBox + Gsmart), who has partnership with for DC solutions.

offers AC solutions installed by



### EV Charging Networks

Total intends to operate 150.000 European EV charging points by 2025.

manages 10.000 public charging points in France.

Recently, Total won a concession to install and operate up to 20,000 new charging points in the Amsterdam Metropolitan region, Netherlands.

### Startups & Innovation

provider of alternative fuels in the Netherlands, Belgium and Germany.

specialized in advanced-technology battery solutions.

Total (via Saft) and are planning to build Gigafactory-Sized Battery Plants in France and Germany.



### Partnerships

to improve vehicle charging infrastructure implementation

brand's involvement in Formula-E.

to develop promising EV markets like China and UK.



# “The EV Combat” | Electric Mobility Ecosystem

## Repsol - Market Approach



### EVSE Suppliers



Partnerships with EVSE companies:



Ingeteam



### EV Charging Networks



Company formed with  **EVE** Ente Vasco de la Energía in 2010

- operates a public normal and fast EV charging network in Spain; 1<sup>st</sup> HV installed in Iberia;
- Recently, Repsol has acquired Ibil's charging network and energy commercialization services.

Project leader in **CIRVE** project: “Iberian Corridors of Rapid Recharging Infrastructure for Electric Vehicles”.

### Startups & Innovation

Repsol aims to achieve net zero emissions by 2050.

Repsol Energy Ventures portfolio:



Repsol also invested in Ample




Production of e-scooters for fleets and individuals



### Partnerships



Repsol acquired Viesgo, the 4th largest energy retail company in Spain.

Ibil &  cooperation agreement to give 2<sup>nd</sup> use Irizar's electric buses as stationary energy storage.



# “The EV Combat” | Electric Mobility Ecosystem

## EDP - Market Approach



### EVSE Suppliers

Partnership with  **efacec** offering a comprehensive EV charging solutions for home, work and public use, included a pilot in place for professional fleets located in Lisbon.

AC solutions




### EV Charging Networks


EDP Comercial is one of the operators of public Portuguese EV charging network.  
EDP aims to achieve 100.000 charging points installed by 2025 (private and public).

Also participated in  project: “Iberian Corridors of Rapid Recharging Infrastructure for Electric Vehicles.”

### Startups & Innovation

 is an acceleration program for development of new business projects in the area of clean technologies.


 Generation, consumption, equipment, automation, energy efficiency in a single app.

 Charging solution start-up for parkings/home/work.



### Partnerships

Network of fast charging for company' electric fleets in partnership with 

 Public commitment to electrify their fleet by 2030.



Partnership to build the first electric corridor between São Paulo and Rio de Janeiro.



# “The EV Combat” | Electric Mobility Ecosystem

## Enel X - Market Approach



### EVSE Suppliers

**enel x** was created within the Enel Group as a company dedicated to the development of electric mobility.

Enel X offers a complete catalogue of products, systems and accessories for recharging electric vehicles.

Acquisition of **eMotorWerks**  **Juice Plan:** Integrated subscription offer 

### EV Charging Networks


Enel X has undertaken a five-year plan for installing charging infrastructure in Italy: 14,000 stations by 2022.

**endesa x** plans reaching 8,500 public recharging points and more than 100,000 private points between 2019-23 in Spain.


**enel x** expects to have around 455.000 charging points worldwide by 2021.




### Startups & Innovation



Enel X Recharge App




Enel X participating in Hubject joint venture




Juice Ability: 1<sup>st</sup> device to charge electric wheelchairs with charging infrastructure


### Partnerships




Enel X will install 120 IONITY ultra-fast chargers in Italy



Official smart charging partner



Title sponsor of the FIM1 MotoE World Cup



Enel X joined the EV30@30 campaign





# “The EV Combat” | Electric Mobility Ecosystem

## EDF - Market Approach



### EVSE Suppliers

EDF wants to become leader in “Smart Charging” by 2022, aiming to operate 4,000 smart charging points by 2020.

EDF acquired a majority stake in  

EDF Renewables North America acquired PowerFlex Systems, a start-up with a patented technology called Adaptive Charging Network.

### EV Charging Networks


EDF wants to become the leading public and private charging network operator in France, the UK, Italy and Belgium.


Through  , EDF aims to deploy 75 000 charging points by 2022.

EDF & Nuvve formalise V2G charging venture 

### Startups & Innovation

 Start-up which has developed vehicle-to-grid bidirectional charger software technology

 Start-up that converts streetlights into charging points


 UK start-up specialising in battery storage and charging infrastructure.



### Partnerships

Corri-Door network (200 quick chargers) around France

Develop shared offerings in the areas of electric mobility, smart charging, second-life battery use, energy storage and renewable energy sources

Vehicles + Charging + Energy Supply integrated offer in UK 



# “The EV Combat” | Electric Mobility Ecosystem

## ENGIE - Market Approach

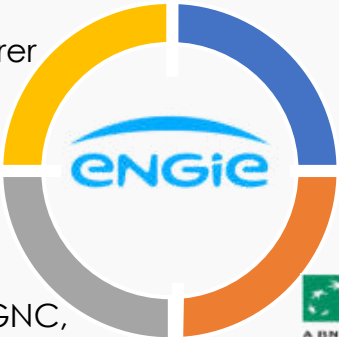


### EVSE Suppliers

ENGIE is fully integrated (designs, installs and maintains electric charging stations and supplies them with green electricity).

Engie acquired **EVBOX** in 2017, a global manufacturer of EV charging stations and charging management software, and in 2018, they acquired **EVTRONIC**, a HV charging station manufacturer

Portfolio range: from 3,7 to 350kW



### EV Charging Networks

**EVBOX** operates more than 85.000 charging points in more than 45 countries and made a public commitment with a 1 million charging points goal by 2025.

Integrated offerings contracts:

- Won a 10y service contract for  **Pacific Gas and Electric Company** (2.600 chargers)
- Won a 12y service contract for **City of Rotterdam** (4.000 chargers)

### Startups & Innovation

**GNVERT** operates nearly 150 alternative stations (CNG, BioGNC, LNG, Hydrogen ...)

**ENGIE Storage** Engie acquired Green Charge Networks (now Engie Storage) in 2016, a battery storage company US-based



ENGIE's green mobility program




### Partnerships

 **ARVAL** A BNP PARIBAS company Green transport offer with a monthly rental fee, EV leasing from Arval and the installation and maintenance by Engie



Roaming agreement for Europe and USA



Official Associate Partner in  **NIO** Formula E Team

# “The EV Combat” | Electric Mobility Ecosystem

## E.ON - Market Approach



### EVSE Suppliers

E.ON acquired Innogy, which bundles electric mobility under eMobility Solutions



Innogy acquired **BTCPower** : full DC product portfolio



E.ON acquired **VIRTA** , an e-mobility platform provider.

### Startups & Innovation



E.ON invested in Vinli, a Dallas start-up, an connected car and data intelligence platform provider

innogy eMobility has acquired **RECARGO**, an US e-mobility software company which developed



### EV Charging Networks



aims to install 10.000 charging stations all over Europe, with more than 250 Ultra Fast chargers by 2020.

E-mobility service provider Clever and E.ON are setting up a joint venture to operate 48 ultra-fast charging stations on certain Scandinavian motorways.

### Partnerships



Develop mobility, financing, and energy services for corporate and private customers, plus municipalities, in Europe.



Cooperation on charging and V2G services as well as renewable distributed energy projects.



Public commitment to electrify their fleet by 2030.




# “The EV Combat” | Electric Mobility Ecosystem

## VW - Market Approach




### EVSE Suppliers

VW sets up electric company Elli, focused on providing green power and EV charging solutions, for both private and corporate customers.




Smart 22 kW Wallboxes



360 kW Mobile charging station concept

### EV Charging Networks

 \$2bn investment plan: 2,000HV chargers installed by 2027.

Volkswagen plans to build 36,000 charging points in Europe by 2025.

VW & E.ON plans to rollout its mobile HPCs with battery storage.

### Startups & Innovation



Electrification of the entire model portfolio by 2030 (300 models)

 €900 million investment in the battery manufacturer



\$34 Billion budget in Electric Mobility, AVs, new mobility services and digital connectivity until 2025

### Partnerships

 JV with BMW, Daimler, Ford and VW: 2,400 chargers by 2020



Rumours on cooperation on EV and Autonomous vehicles development



3 JVs for EV and charging infrastructure in China: FAW, SAIC and JAC

# “The EV Combat” | Electric Mobility Ecosystem

## PSA + FCA - Market Approach



### EVSE Suppliers

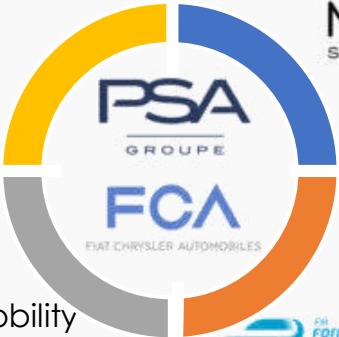
Partnership with **podPOINT** in the UK for install EV chargers Renault and Citroen dealerships and also be the recommended supplier.

FCA teamed up with Engie & Enel X for charging solutions in 15 European countries.

### EV Charging Networks


Partnership with **ChargeNow** for PSA EV users in France: access to 9.000 charging stations.

**FREE2 MOVE SERVICES** The Charging Pass allows users to access 85,000 locations in Europe.




### Startups & Innovation



**FREE2 MOVE** ambition is to become the preferred worldwide mobility services provider by 2030

 ambition to provide a 100% EV/PHEV portfolio by 2025

FCA is investing billions in factory electrification

### Partnerships

 DS Techeetah Formula E Team with **efacec** sponsorship

  Involvement in V2G projects

**FCA** & Foxconn plan EV joint venture for the Chinese market

# “The EV Combat” | Electric Mobility Ecosystem

## Nissan - Market Approach



### EVSE Suppliers

Nissan launched an Energy services company to create EV “ecosystem”.

Nissan Europe helped to expand CHADEMO, making several EVSE partnerships



Partnership with **chargemaster** in the UK for HC (w/ Leaf)  
V2G charger developed in partnership with OVO Energy



### EV Charging Networks

There are more than 2,300 Nissan Quick Chargers across Europe and it will be expected 5,500 QC by 2020.



gives Nissan EV drivers access to multiple charging networks in US (EVgo, ChargePoint, Greenlots)



JV with several companies: 7,000 CHADEMO installed.

### Startups & Innovation



Leaf: 1st car with V2G capacity  
Certified as 1st Mobile Power Plant in Germany

ProPILOT: autonomous driving  
12V Invisible-to-Visible Technology Concept

NISSAN INTELLIGENT MOBILITY

### Partnerships



Cooperation on charging and V2G services as well as renewable distributed energy projects



EV Ecosystem: Nissan Energy vision connects electric cars with homes, businesses and power grids



Renault-Nissan-Mitsubishi plans doubling annual synergies



# Thank you!

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