Empowering the Future.

“The EV Combat”
2020

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“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

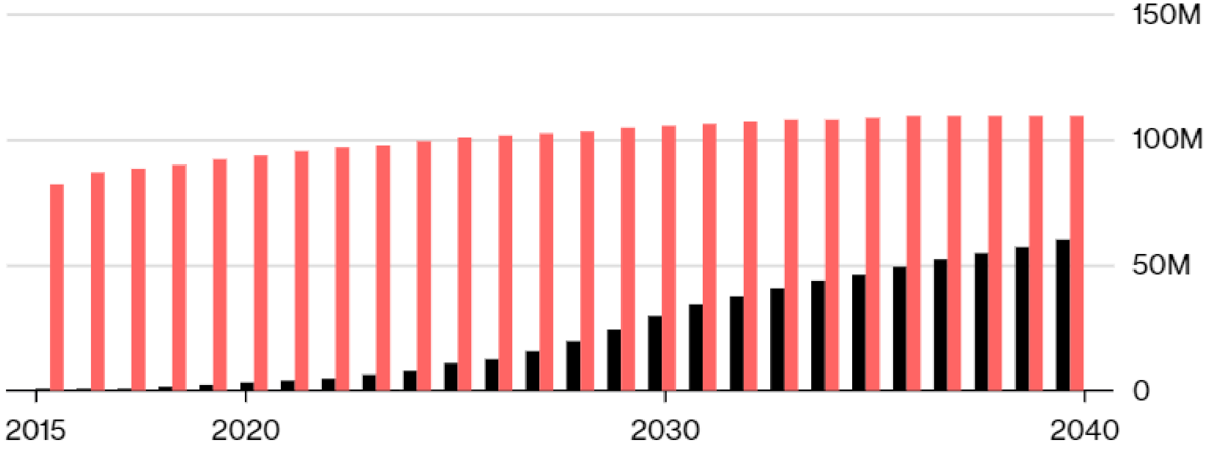
By Kelly Gilblom and Anna Hirtenstein

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



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

BloombergNEF

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Automakers' Drivers

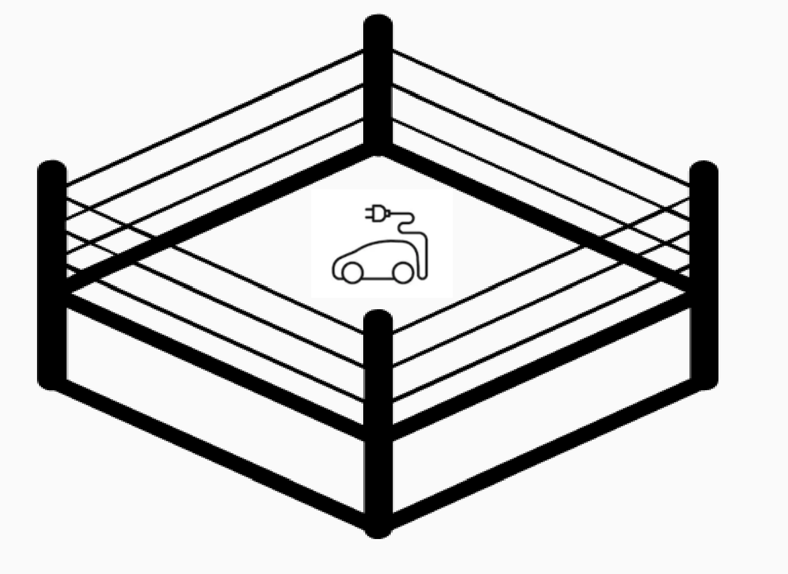
- Electrification & Decarbonisation forces
- Maintain Competitive position in Mobility
- New Business Models

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

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“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

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"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 powering the future (£130M*), the largest public, workplace and home charging units supplier in the UK (largest network) POLAR The EV charging network

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 IBIL 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 An Enel Group Company that developed JuiceNet, an EV charging platform

New Business Models

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

Engie and ARVAL A BNP PARIBAS company 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

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* (not confirmed figures)

“The EV Combat” | Electric Mobility Ecosystem

Business Models Benchmarking (1/2)

BUSINESS MODELS	BM #1	BM #2	BM #3	BM #4	BM #5
	Operate public charging stations thanks to authentication methods and simple platform and bills consumers for their use	Operate public charging stations and use them in order to attract consumers to retail locations and promote brands	Aggregate CPO’s to maximize network coverage and unified authentication methods	Use data generated y public and semi-public charging to develop smart software and advisory services	Optimize energy production and distribution, through data collection and software dev. to develop end-to-end energy offers
	CPO Direct revenues	**CPO - Indirect revenues**	**Sinergies / Smart Platform Dev.**	**Smart Charging Services**	**Digital energy offer**
PLAYERS	bp chargemaster; efacec Empowering the future	IKEA	charge your car	Enervalis	octopus energy

"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

edp efacec Empowering the future	TESLA	MOBI.E	efacec	evconnect HUBJECT

Thank you!

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