



ACEA

European
Automobile
Manufacturers
Association

ENSURING CO₂ AND AFID REVIEWS GO HAND-IN-HAND

31 May 2021

May 2021

PREAMBLE

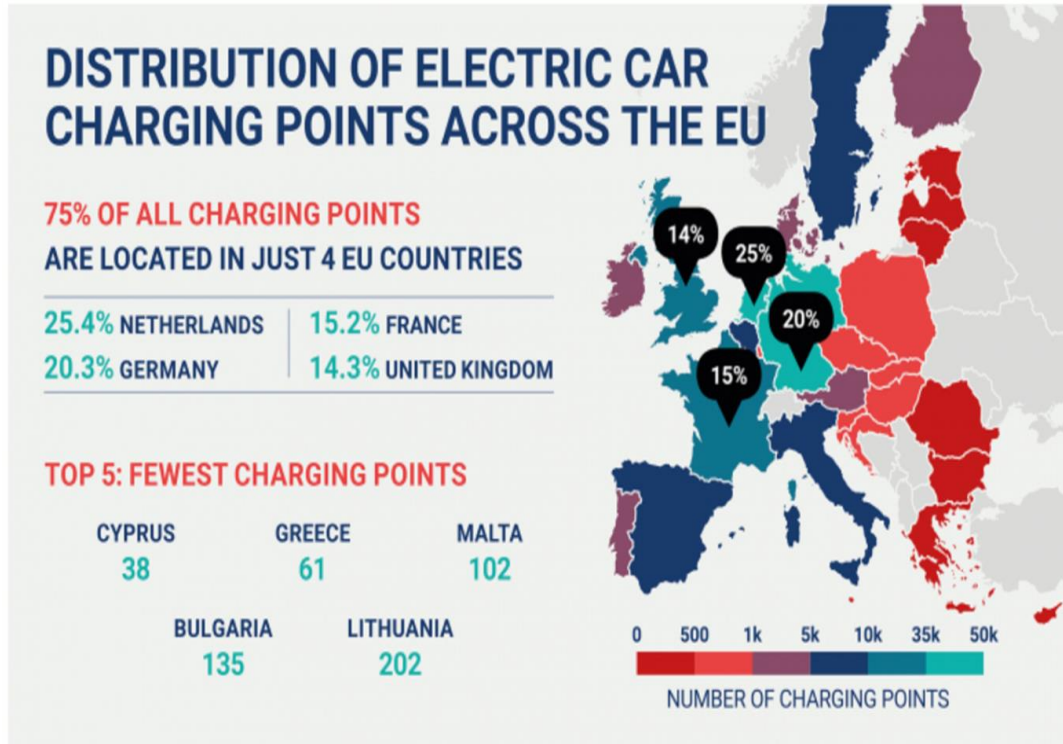
- “e-mobility uptake is linked to the availability of affordable and easily accessible charging”
(Frans Timmermans, March 19th 2021)
- It is a logical next step that a further strengthening of a fleet-regulation needs to be accompanied by a strong AFID regulation with appropriate distribution and binding roll-out plans for each Member State.
- An European wide charging and refuelling infrastructure is a mandatory precondition to achieve the CO₂-targets and to support market uptake and customer acceptance of E-mobility.
- The Commission announced 1 million public charging points to be necessary in 2025 and 3 million by 2030 to achieve the actual -37.5% CO₂-fleet target for passenger cars.
- A further decrease of CO₂ emissions to -50% in 2030 for passenger cars requires around 6 million publicly available infrastructure points based on calculations published by the Commission.
- In addition to public charging vans will have an increased demand for semi-public or private charging to achieve higher CO₂ 2030 targets and beyond.
- Through AFID review in June 2021 mandatory targets for member states related to the CO₂ fleet emission targets have to be established.

PROPORTIONALITY PRINCIPLE

OBJECTIVES

- Having clear split between CO₂ file and AFID reviews, but ensure that proposed CO₂ target are calibrated to corresponding AFID proposal.
- Ensure appropriate AFID proposal with binding infrastructure targets for member states that is aligned to an ambitious given CO₂ target and earmark appropriate investment budgets within the framework of the EU recovery funds.
- Additional supportive measures to be expected within EPBD review and propose simple solution that provides also flexibilities for the member states within AFID review
- Validity both for passenger cars and to appropriate extent to vans

OBJECTIVES



- The growth of the infrastructure is not keeping pace with the rising demand for electric vehicles.
- Public, standardized infrastructure are important to enable high e-driving shares and seamless travelling across Europe.
- Ensure sufficient infrastructure for increased CO₂ ambition level

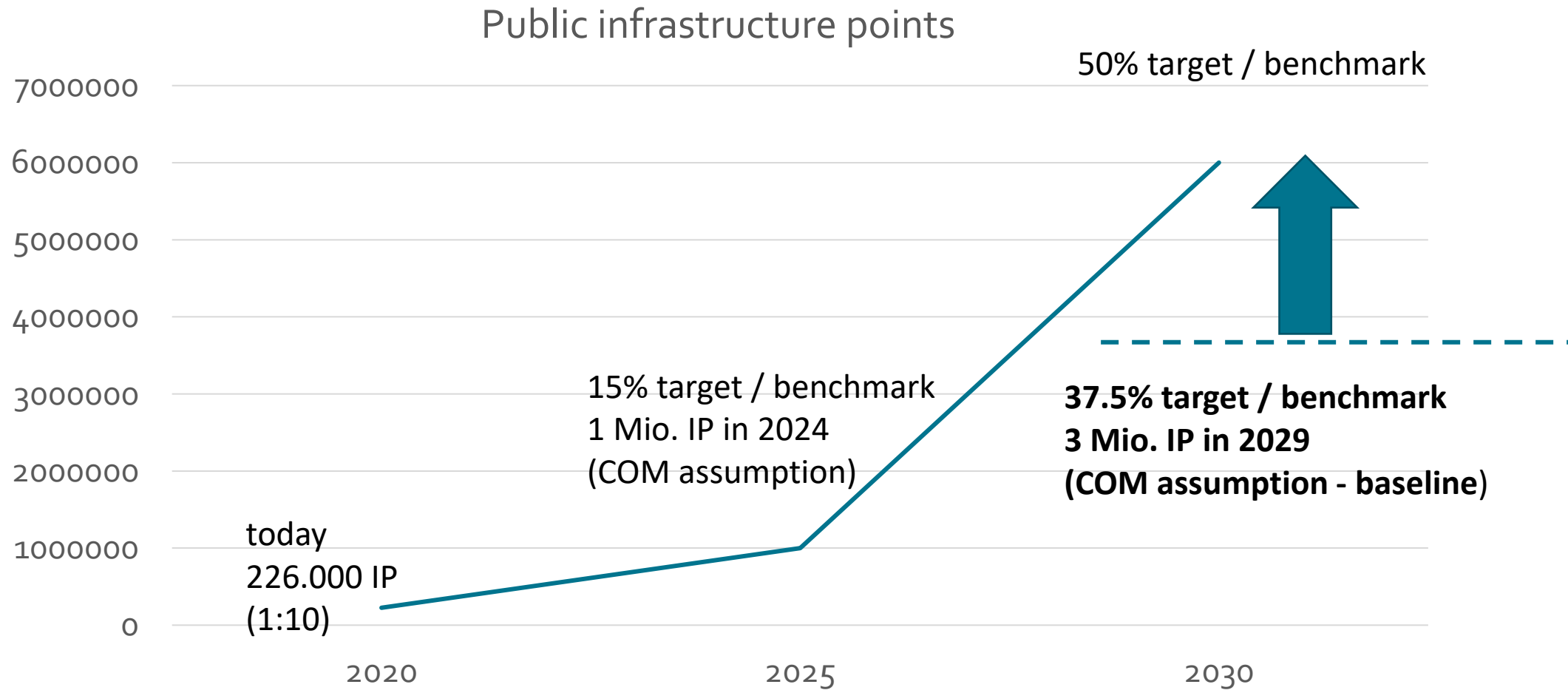
BACKGROUND ASSUMPTIONS – INFRASTRUCTURE INCREASE RATIO

Projected number of EV and number of public electric charging points in 2030 (thousands)				
Scenario	Plug-in hybrid vehicles (PHEV)	Battery Electric Vehicles (BEV)	Total PHEV + BEV	Number of public charging points (thousands)
30%	16,494	9,780	26,274	2,627
40%	21,331	12,256	33,587	3,359
45%_40%ZLEV	35,906	27,086	62,992	6,299
50%	27,584	15,394	42,978	4,298
50%_30%ZLEV	29,008	23,481	52,489	5,249
50%_50%ZLEV	10,768	49,499	60,267	6,027
75%	61,035	27,158	88,193	8,819

Table 5: 2030 Projected number of EV and number of public electric charging points

- Current targets for PC required around 3mil infrastructure point (IP)
- The 50% target/50% benchmark for PC requires around 6 mil. IP
- This leads to simplified ratio of 200.000CP extra needed for 1% additional CO₂/benchmark ambition level
- Industry is willing to accept higher CO₂ targets provided there is a sufficient number of infrastructure points available.
- AFID has to ensure binding infrastructure targets for the member states which are aligned to a given CO₂ target in 2030.

BACKGROUND ASSUMPTIONS – LINKING INFRASTRUCTURE TO THE CO₂ TARGET FOR PASSENGER CARS



LINKING INFRASTRUCTURE TO THE CO₂-TARGET FOR THE PASSENGER CARS

Automotive industry is committed to ambitious CO₂ targets which have to be ensured by a corresponding and binding AFID regulation.

Proposal of a formula ensuring calibration between binding infrastructure targets in the AFID and CO₂ targets:

EU fleet-wide target₂₀₃₀ =

EU fleet-wide target₂₀₂₁ · (1 – reduction factor₂₀₃₀ – reduction factor cp2029)

New factor to be considered

reduction factor cp2029 = (Public infrastructure points 2029 – 3.000.000) / 200.000

Overall figure to be defined in the AFID final agreement. 2029 is the latest date when the targets have to be fulfilled.

Advantage: Keeping split clear targets in the CO₂ Regulation for OEMs and clear targets for member states in AFID.

Example: AFID will agree on a 5mil charging points across the EU:

EU fleet-wide target₂₀₃₀ =

EU fleet-wide target₂₀₂₁ · (1 – 37,5 – (5 000 000 – 3 000 000)/200 000) = overall target of 47,5% CO₂ reduction/benchmark

AFID REVIEW – FIXING CORRECT AMBITION LEVEL

ESTIMATION OF THE NEEDS

Projected number of EV and number of public electric charging points in 2030 (thousands)				
Scenario	Plug-in hybrid vehicles (PHEV)	Battery Electric Vehicles (BEV)	Total PHEV + BEV	Number of public charging points (thousands)
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Table 5: 2030 Projected number of EV and number of public electric charging points

Source - COM estimates available at:

https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/non_paper_co2_proposal_en.pdf

ESTIMATION OF NEEDS – OVERALL POWER NEEDED (PC)


Assumptions:

- EU average on mileage per year: **12.000 km/year¹**
 - EU average consumption: **20kWh/100km²**
 - **According to the COM estimates, for scenarios reaching targets of:**
 - **current targets (37,5% CO₂ target and 35% benchmark)* – will lead to cca 72 TWh needed**
 - 45% CO₂ target + 40% benchmark – 168 TWh needed
 - 50% CO₂ target only – 113 TWh needed
- **50% CO₂ target + 50% benchmark**

Scenario to be used

144 TWh needed
(60 mil vehicles x 2400 kWh/year)³

Shift to -50%
CO₂ target


- 75% target – 230 TWh needed

1) EU average (as for example used in reced BEUC study – <https://www.beuc.eu/publications/electric-cars-already-cheapest-option-today-many-consumers-new-study-finds/html>). Of course, values for different powertrains and member states may differ

2) Conservative estimates

3) This represents almost 5% of the overall electricity generated in the EU

ESTIMATION OF NEEDS – ACEA FULLY BACKS THE CALCULATIONS BY THE COMMISSION (PC)

Scenario	Plug-in hybrid vehicles (PHEV)	Battery Electric Vehicles (BEV)	Total PHEV + BEV	Number of public charging points (thousands)
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Table 5. 2030 Projected number of EV and number of public electric charging points

60 mio xEVs

ACEA internal calculations

Parameter (excerpt):

- yearly driving distance
- average consumption
- number of charging events per day
- average charging time
- daily energy supply
- ...
- **Utilization Factor**
- **Public Share 36% of energy demand**

German NPM Model

Parameter (excerpt):

- yearly driving distance
- average consumption
- number of charging events per day
- average charging time
- daily energy supply
- ...
- **Detailed consumption calculation per vehicle**
- **Dynamic model-based utilization factor**
- **Public Share 38% of energy demand**

**AFID (2014)
assumpitons**

**Ratio 1/10
public/private**

**All calculations confirm
~ 6,00 mio charging points**



ESTIMATION OF NEEDS – KEY CHALLENGES (PC)

Key challenges:

- More EVs will require more charging events from the public charging points as private charging points become limited (e.g. in cities)
- This would also lead to higher demand for DC charging (more convenient for customers), which could partially compensate that effect
- These trends needs to be reflected in the overall number of publicly available charging points in the future (still keeping conservative ration 1:10 between public and private charging points)

MORE EVS WILL REQUIRE HIGHER SHARE OF PUBLIC CHARGING



**-37,5 % CO2 reduction
baseline and
30 Mio. xEVs
for 2030**



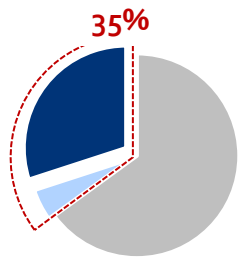
**Public/Highway
charging share**

35%



**Private
charging share**

65%



■ Private ■ Highway ■ Public

Change in **public charging share**:

- Higher EV share incorporates that all customer segments have to be covered. ~50% in EU have no access to private charger
- Additional public charging due to longer distance trips (highway) or better public usability of about 10%
- High EV market penetration and fragmented product/service offering of market players in charging & energy sector.
- Decreasing EV costs and increasing importance of home replacement charging
- Shift focus from AC to Public DC/ HPC, approach to use case "refueling"
- Strict regulation on ICEs in scope of „Green Deal“ with successive withdrawal of subsidy amounts for EVs, HW, SW
- Decentralization of electricity and fluctuating power generation with high relevance of balancing methods (incentive mechanisms load shifting, energy storage and optimization).

**-50 % CO2 reduction
and increased to
60 Mio. xEVs
for 2030 for PC**



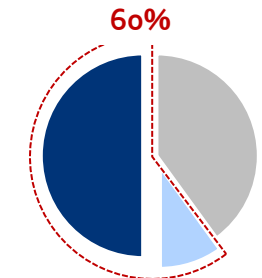
**Public/Highway
charging share**

60%



**Private
charging share**

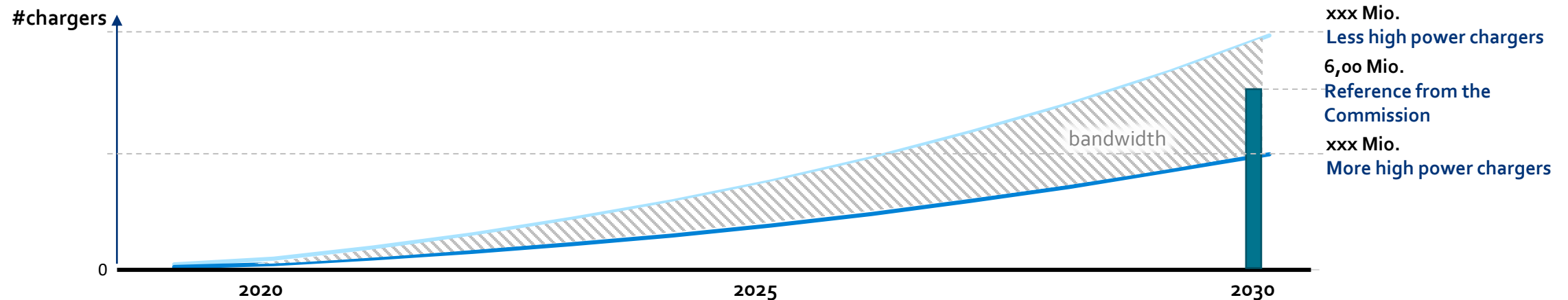
40%



■ Private ■ Highway ■ Public


EXPECTED REAL FUTURE DEMAND WILL INCREASE

- Based on higher demand of public share -
60% of 144TWh means public charge demand of 86TWh
- This influences the number of charging points needed
- Overall demand can be supplied by different structure of AC and DC charging points (e.g. through “substitution factor”



EXAMPLE OF THE SUBSTITUTION FACTOR WITHIN AFID

- Substitution factor might be included (example)

Power class ¹	 Charging current		
AC		1 AC CP	\triangleq 1,0 AC CP
FC (DC)	≥ 125 A	1 FC (DC)	\triangleq 1,5 AC CP
UFC (DC)	≥ 250 A	1 UFC (DC)	\triangleq 3,0 AC CP
HPC (DC)	≥ 500 A	1 HPC (DC)	\triangleq 6,0 AC CP

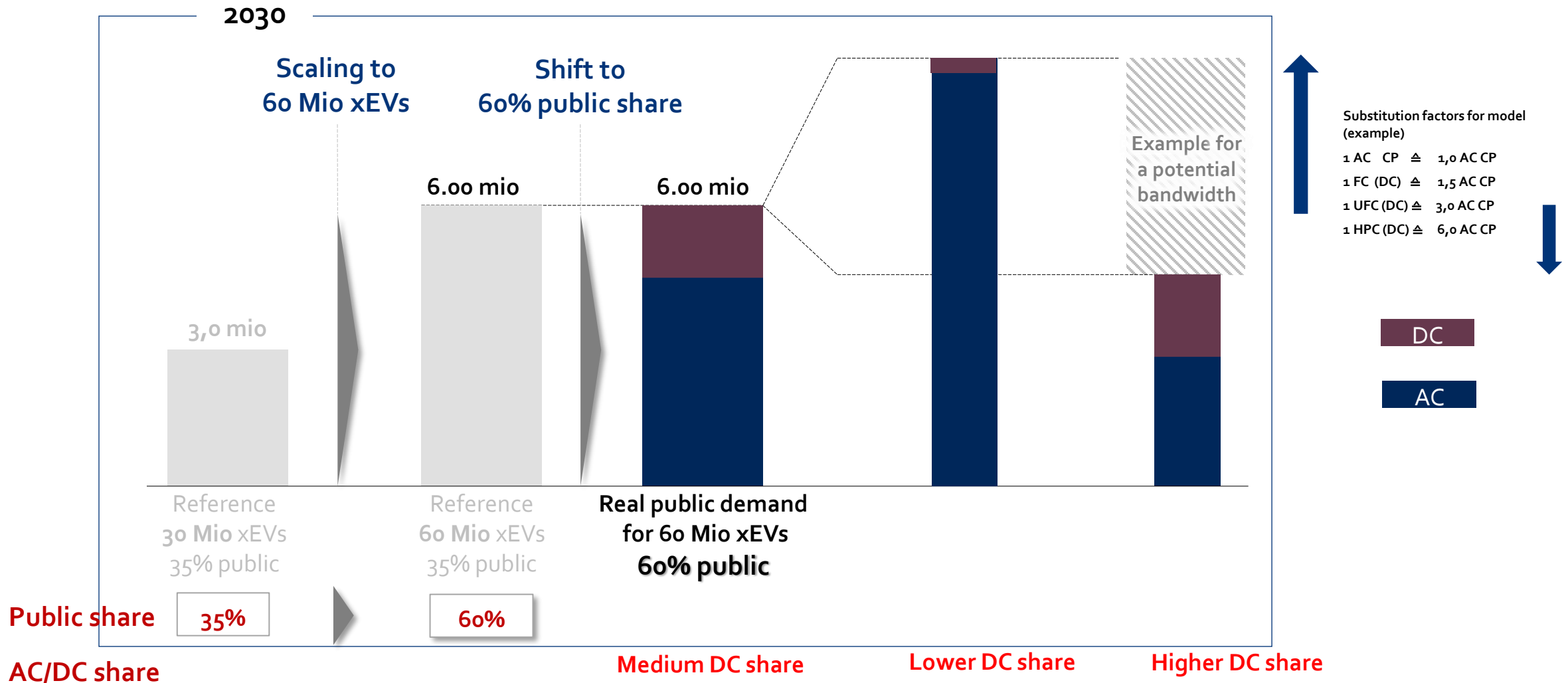
¹) Power class based on Position Paper/Recommendation of Charging Interface Initiative e.V., DC CCS Power Classes V, 2021/04

- This will:

- Lower overall number of charging points needed on the national level based on higher quality
- Gives flexibilities to the member states reflecting quality of the charging infrastructure

SUBSTITUTION FACTOR - EXAMPLE

Required public charging points @ -50,0% CO₂ reduction for PC with 60% energy demand for the public charging points



VALUE ADDED OF THE SUBSTITUTION FACTOR

- The overall target per member state is defined as the required number of 11kW AC charging points.
- The substitution factor supports keeping baseline of 6mil charging points on EU level which corresponds to 50% CO₂ Regulation ambition level.
- If member states decide to establish DC charging, the substitution factor works as a multiplier. It adjusts the number of charging points needed to meet a member state's overall AFID infrastructure target.
- Overall the quality of infrastructure for consumers can be improved and member states which decide for high quality charging are incentivized.
- This approach should be considered as part of the AFID review proposal 2021, could be further fine-tuned for foreseen review in 2024/2025.

AFID REVIEW – OTHER ISSUES

ADDITIONAL NEEDS RELATED TO INFRASTRUCTURE

- Regular monitoring of the CP (via Eurostat or endorsed and improved EAFO). Best on a quarterly basis – this provides clear picture about trends
- Monitoring need to follow qualitative parameters of the infrastructure points (e.g. power, accessibility)
- Binding targets for 2024 and 2029 should be accompanied by other qualitative requirements ensuring EU-wide equal distribution and quality of the infrastructure (e.g. max 50km till 2025 and max 30km till 2029 between fast charges on the key roads)
- Full and EU-wide implementation of the communication standards (especially ISO15118 mandatory for all charging points)
- The CO₂ targets for vans should be treated differently because for these vehicles there will be additional needs such more need for semi-public or private charging due to different charging behaviour (e.g. within EPBD review provided that AFID focuses only on public charging points)

SUMMARY



- Several calculations confirm 6mil charging points needed for 50%/50% CO₂ passenger cars targets (Commission's figures – baseline scenario)



- Future increase in public charging share needs to be reflected
- Substitution factor can make qualitative change and increase mandatory target acceptance



- Example of substitution factor to be included

AC charging point	= 1 point
FC (DC) charging point	= 1,5 points
UFC (DC) charging point	= 3 points
HPC (DC) charging point	= 6 points



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www.acea.be
+32 2 732 55 50
communications@acea.be



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