ENERGY EXPERTS

European Copper Institute
Copper Alliance

150 kW Charging Maps

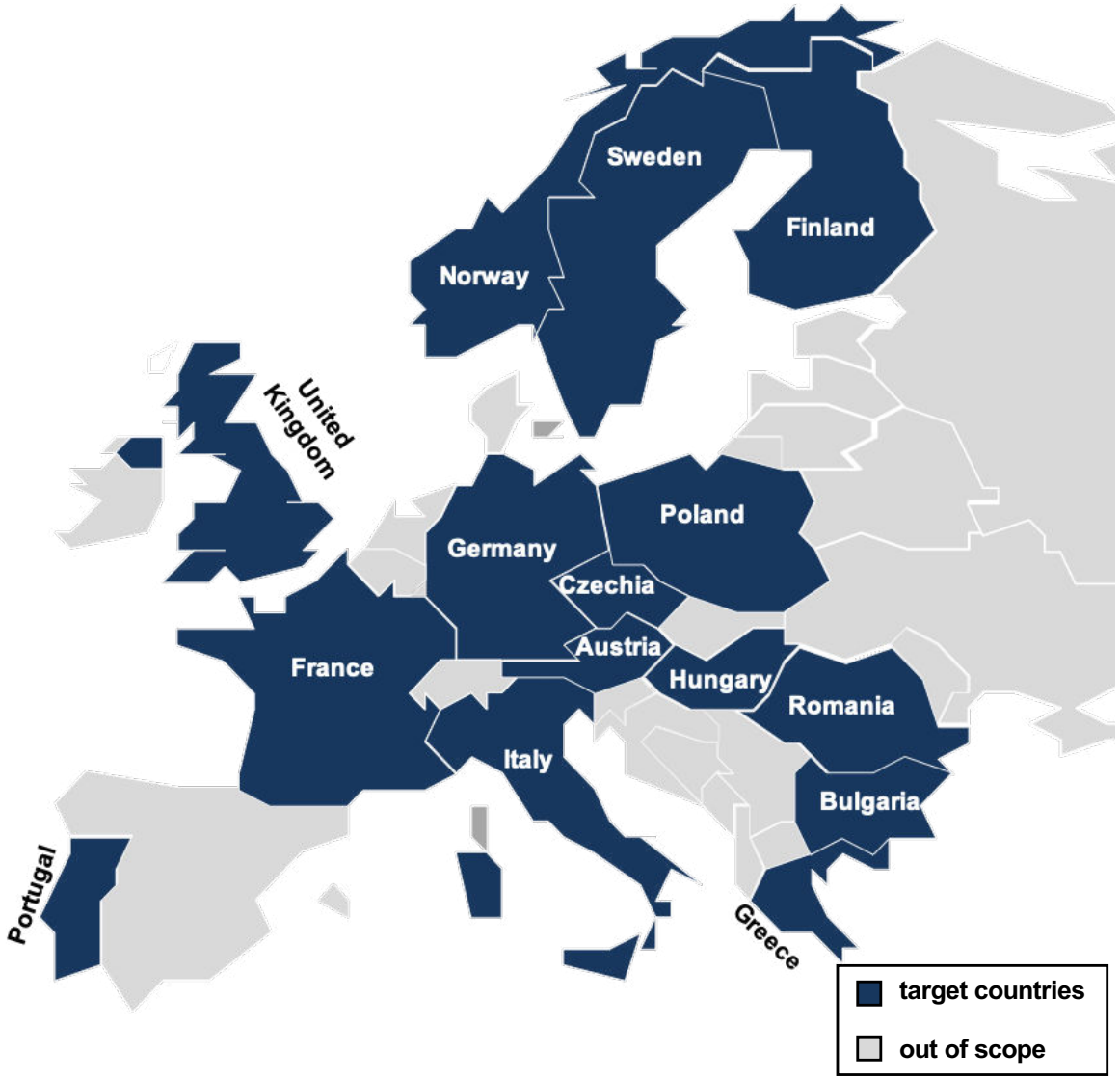
Final Results

Information updated to December 2019

Engineering Consulting ESCO Software

This +150kW study is focused on 15 European countries

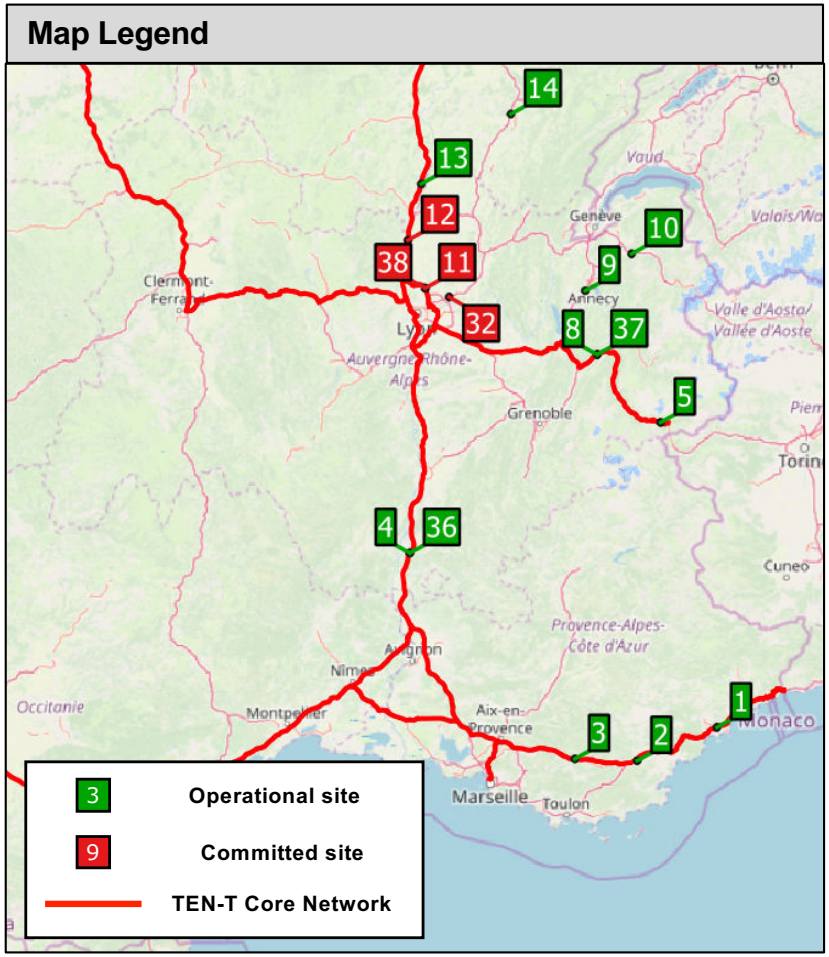
- The objective of this study is to provide a snapshot of **public +150kW sites for Electric Vehicles (EVs)** compatible with all EV manufacturers with available power **higher than 150 kW***
- The study is focused on the **15 largest EU states** based on surface and population, besides Spain
- **The development of +150kW sites is paramount in order to impulse EV sales:**
  - With 150 kW, charging times are short enough to convince consumers to choose EVs for long distance travel. Tesla superchargers are a proof of it.
  - To get over range anxiety, as important as the charging power is the even deployment of sites. It is recommended to start with sites on the TEN-T Core Network every 60 km, accessible from both ways of the road when possible.



(*) Tesla Charging infrastructure was not addressed in this study

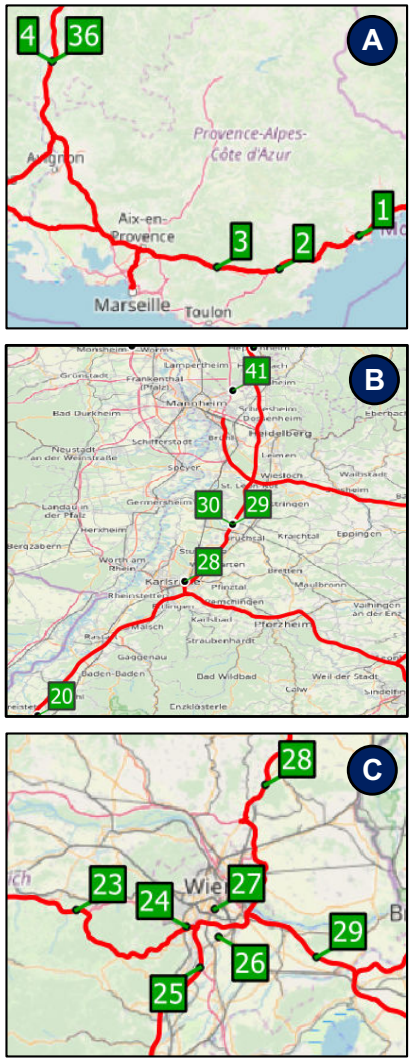
The study is based on interviews and other publicly available information

- **The information presented is based upon:**
  - Publicly available web-based maps
  - Interviews with operators and other stakeholders
  - Available studies and documentation
  - Connecting Europe Facility project plans
- **When charging operators declined to provide coordinates of future sites and they were part of a Connecting Europe Facility (CEF) project, the sites were allocated between involved countries according to:**
  - The national TEN-T Core Network length
  - The national EV market maturity
- **The study distinguishes between:**
  - **Operational sites,** which are already available to the public
  - **Committed sites,** either in construction phase or planned, to become operational before 2022



Statistics provide a measure of charging infrastructure development

- **The statistics on the average distances between charging sites** have been calculated considering the actual travel distance between consecutive sites located on the TEN-T Core network along a certain direction (e.g. north to south), avoiding double counting of the distance between the same sites. **The following cases have been considered:**
  - **A. Sites only accessible from one direction** - In this case, only the sites along the selected travel direction are considered. In the first example, sites 1 and 3 are accessible only when travelling west, while 2 and 4 are accessible only when travelling east. In this case, the distances considered for the statistics are **1-3** and **4-2**.
  - **B. Sites accessible from both directions** - This scenario allows all charging stations to be considered, so distances are measured between the nearest sites considering only one travel direction. In the second example, distances are measured between every single point, this means **20-28**, **28-30**, **30-41** (29 is not considered as it is the twin of 30, laying on the opposite side of the road).
  - **C. Multiple points in a relatively small area -** Primarily, this case is found in cities with multiple charging stations. The solution has been to select only one of the sites that belong to the city and continue with the travel direction as if there was only one charging station. In the last example, the considered distances are:
    - **23-24**, **24-26, 26-29** moving from west to east
    - **25-27**, **27-28** moving from south to north



Charging sites, publicly available to all vehicle brands, 150 kW or higher, currently in service or committed to be before 2022, in the listed countries (December 2019)

Country	Number sites on TEN-T Core Network		Number sites outside TEN-T Core Network		Average distance between consecutive sites on TEN-T Core Network (in use and committed)				Charging points per site on TEN-T Core Network (of sites with coordinates)	
	In use	Committed before 2022	In use	Committed before 2022	With coordinates [km]	Standard deviation [km]	Core Network lenght (completed or to be upgraded) [km]	With and without coordinates [km]	Average	Standard deviation
Austria	25	41	15	6	48	32	1100	17	2.8	1.7
Bulgaria	-	5	-	-	-	-	1304	261	-	-
Czech Republic	1	27	-	-	88	27	680	24	3.8	2.4
Finland	2	25	1	25	213	-	1098	41	2	0.0
France	27	104	13	10	165	119	3500	27	4.1	0.5
Germany	98	204	49	31	60	40	6365	21	3.3	1.2
Greece	-	-	-	-	-	-	1782	-	-	-
Hungary	2	19	-	-	68	24	1058	50	3.1	1.1
Italy	4	139	1	10	223	277	4302	30	3.8	1.0
Norway	10	42	29	64	17	7	163	3	2.3	2.0
Poland	1	40	-	18	152	78	3884	95	1.7	0.6
Portugal	-	6	-	-	-	-	944	157	-	-
Romania	-	12	-	-	-	-	2599	217	-	-
Sweden	11	86	4	27	109	48	3012	31	3.7	0.7
United Kingdom	5	179	8	109	176	76	2077	11	3.8	0.7
TOTAL	186	929	120	300			33868			

LIST OF DATA SOURCES +150kW SITES

Source	Link	Type
Fastned	https://fastnedcharging.com/en/locations	Operator
Ionity	https://ionity.eu/en/where-and-how.html	Operator
Neogy	https://www.neogy.it/rete-di-ricarica/mappa-delle-stazioni-di-ricarica.html	Operator
Comfortcharge	https://www.comfortcharge.de/#endkunden	Operator
Drevag	https://www.drewag.de/wps/portal/drewag/cms/menu_main/privatkunden/produkte/energievielfalt/mobilitaet/elektromobilitaet	Operator
Stromticket	http://stromticket.de/	Operator
Innogy	https://iam.innogy.com/static-web/ladesaeulenfinder/ladesaeulenfinder.html	Operator
Fortum	https://www.fortum.com/products-and-services/vehicle-charging/charging-locations	Operator
Allego	https://www.allego.eu/consumer/find-a-charge-point#	Operator
E.ON	https://map.eondrive.co.uk/	Operator
Chargedrive	https://map.chargedrive.com/en/	Operator
Greenway	https://driver.greenwaypolska.pl/#/portal/locations	Operator
Alperia	https://www.alperia.eu/la-mia-impresa/e-mobility.html	Operator
Chargemap	https://chargemap.com/	EV Charging maps
ZapMap	https://www.zap-map.com/live/	EV Charging maps
Europe-e	https://europ-e.eu/#network	CEF project
Ultra-e	https://www.ultra-e.eu/	CEF project
Next-e	https://next-e.eu/about.html	CEF project
CEUC	https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2017-eu-tm-0065-w	CEF project
Mega-e	https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2017-eu-tm-0068-w	CEF project
E-via Flex-e	https://www.eviaflexe.com	CEF project
Ambra-e	https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2017-it-tm-0110-w	CEF project
E.ON X CLEVER	https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2016-eu-tm-0121-w	CEF project
Ten-T Core Network Maps	https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html	EU Institutions
CEDR TEN-T Report	https://www.cedr.eu/download/Publications/2018/TEN-T-Performance-report-2017.pdf	EU Institutions
Connecting Europe Facility	https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport	EU Institutions