CUMIN - ERICA

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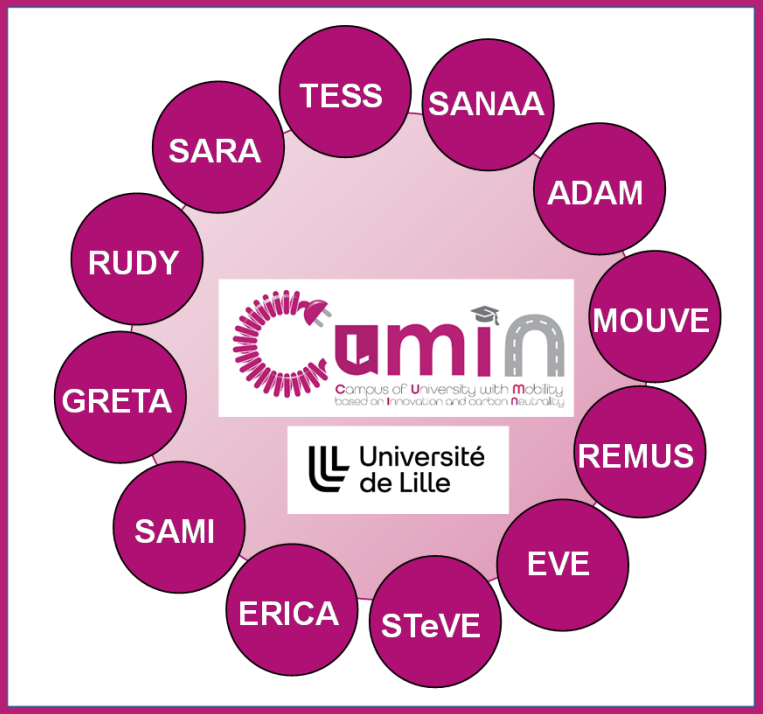

Efficient Renewable energies Integrated systems in Charging stations of EV : Acceptance & governance (ERICA)

Progression of electromobility through the evolution and distribution of charging stations for electric vehicles in France.

Authors

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Introduction

TESS

REMUS

EVE

ADAM

MOUVE

SARA

SANAA

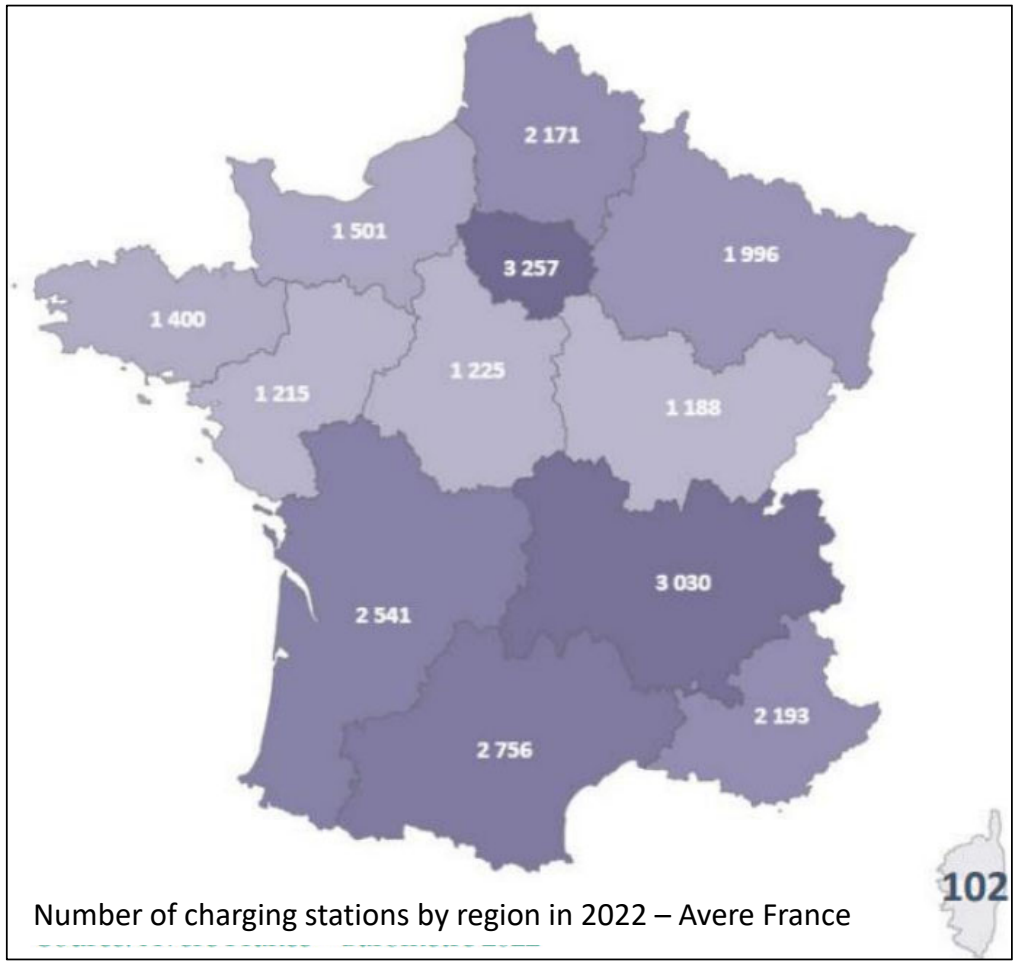
CUMIN (Campus of University with Mobility based on Innovation and carbon Neutrality)

- The CUMIN program aims to develop a demonstration campus based on electromobility, in order to reduce greenhouse gas emissions on the campus of Cité Scientifique .
- The ultimate goal of CUMIN is to use the eco-campus as a real-life laboratory so as to develop eco-cities.

ERICA

- ERICA is one of the research projects led within the scope of CUMIN
- ERICA studies the question of the introduction of renewable energies in the charging stations for electric and hybrid vehicles. The ERICA project also deals with its concrete application by local actors and its social acceptability.

Introduction



Number of charging stations by region in 2022 – Avere France

About this presentation

- This presentation draws up an inventory of the evolution and repartition of charging stations in France. This inventory was made at different scales using diferent data sources.
- The presentation also deals with the economical, social and environmental stakes related to the progress of electromobility

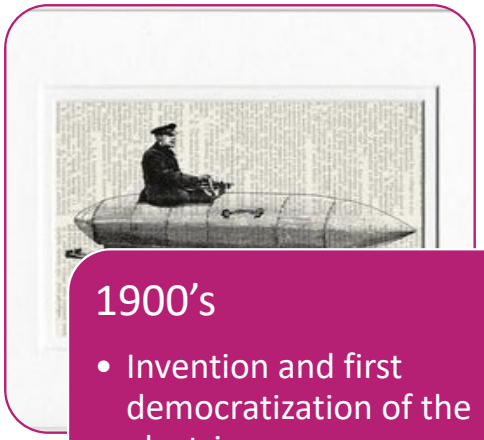
Outline

State of the Art :
Evolution of electromobility in France

Methods :
Data used to draw up this inventory

Results :
General state of the charging stations network in France and possible improvements

1. State of the art

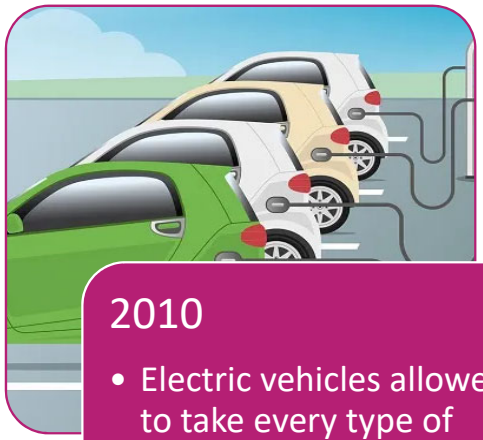


1900’s

- Invention and first democratization of the electric car
- Technological limitations and inadequate developement strategy

1990’s

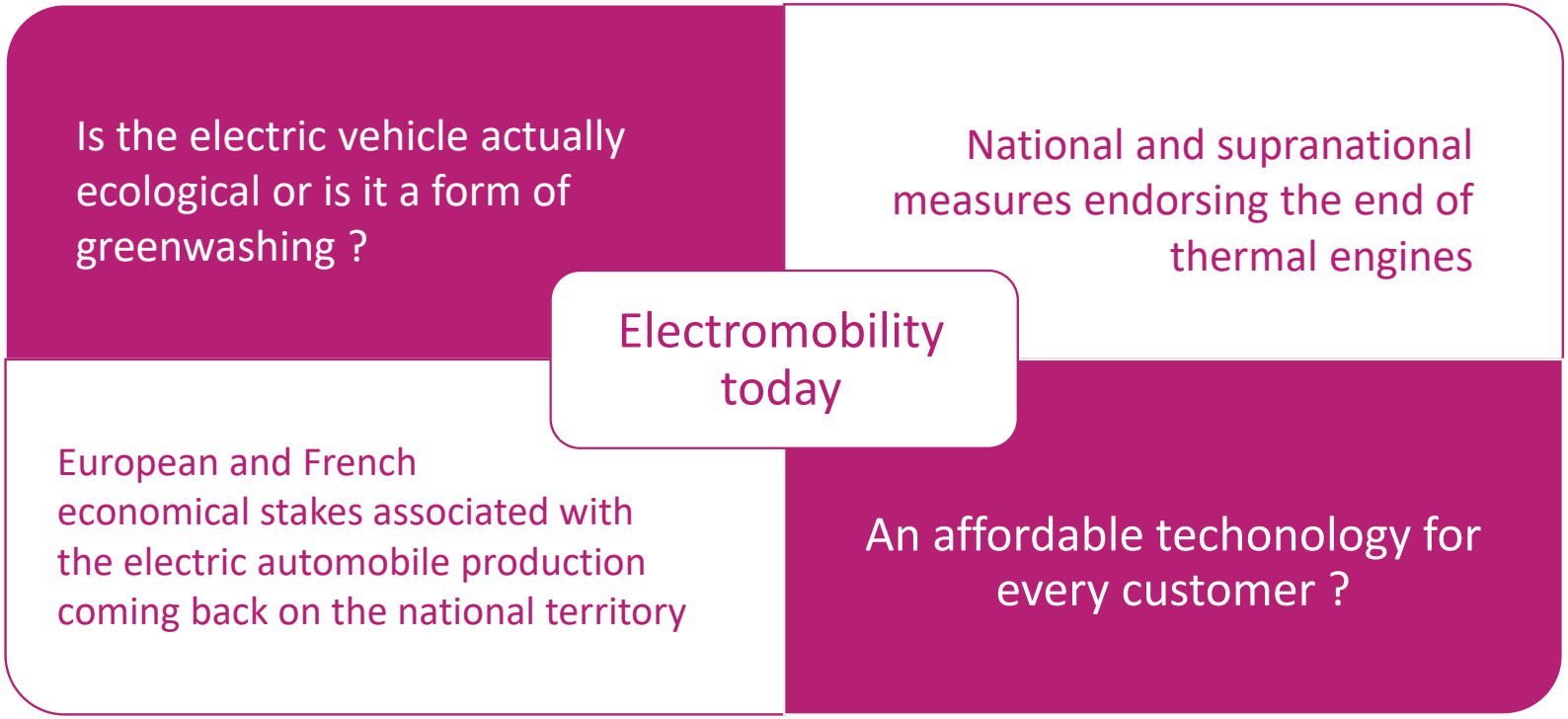
- Renewed success thanks to environmental awerenesse.
- Supplanted by more affordable and efficient car models



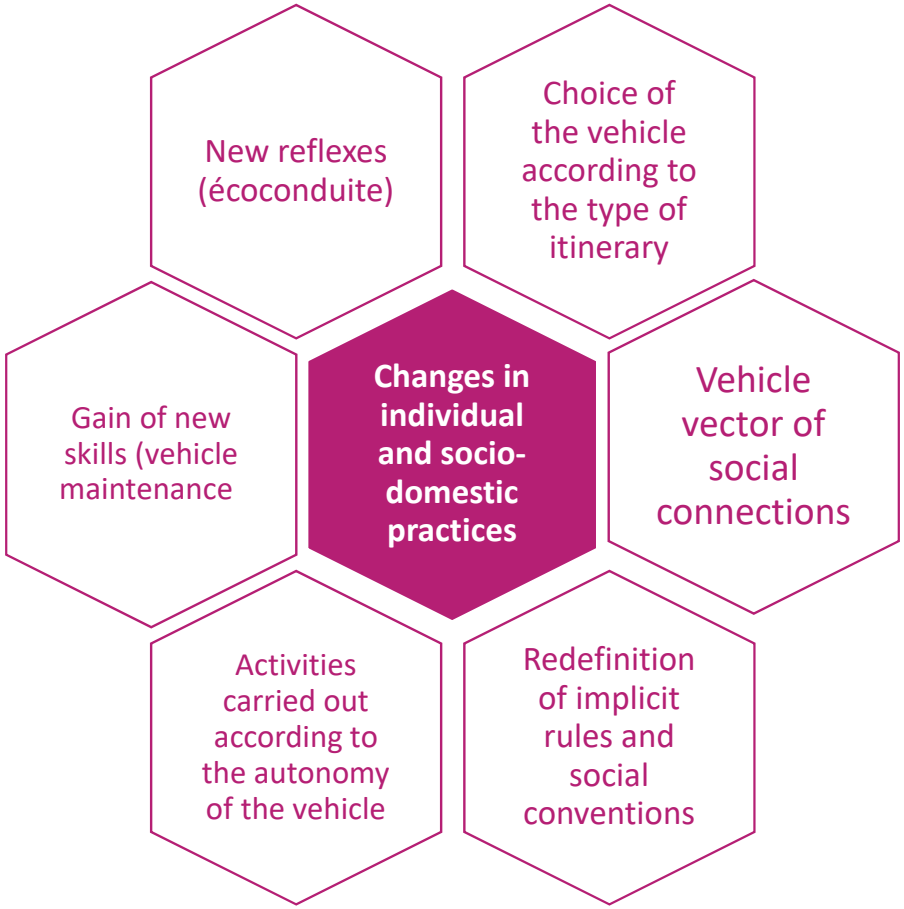
2010

- Electric vehicles allowed to take every type of roads
- Challenging social acceptabiliy and collaborations between actors.

1. State of the art



1. State of the art



2. Methods

Data.gouv

- Yearly dataset
- Table (csv)
- Lists the information provided by charging stations installers (public and private)
- Data available online for free

ChargeMap

- Continuously updated by users Interactive map
- Collaborative site that lists all the public charging stations
- Data requiring the implementation of an extraction method (manual counting) to be extracted

Base de données MOUVE

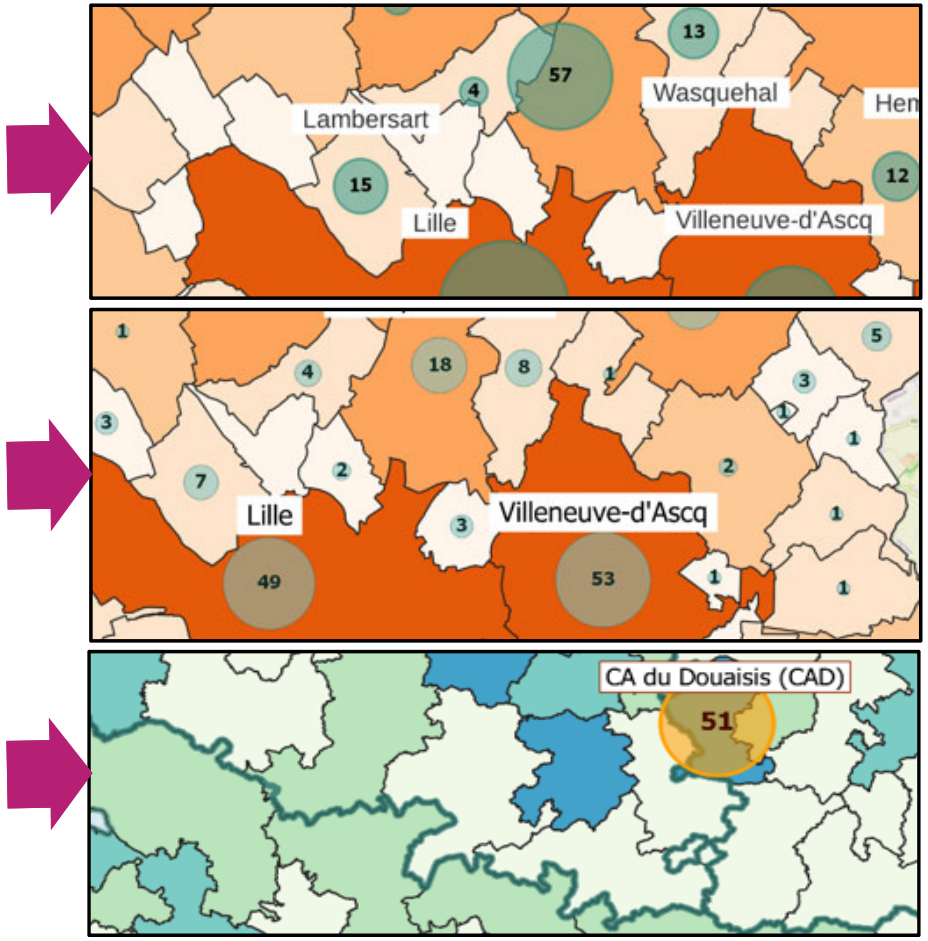
- Database updated in 2022
- Table (csv)
- Combines information from ChargeMap and data.gouv on the Nord-Pas-de-Calais region
- Limited access database

Other information sources

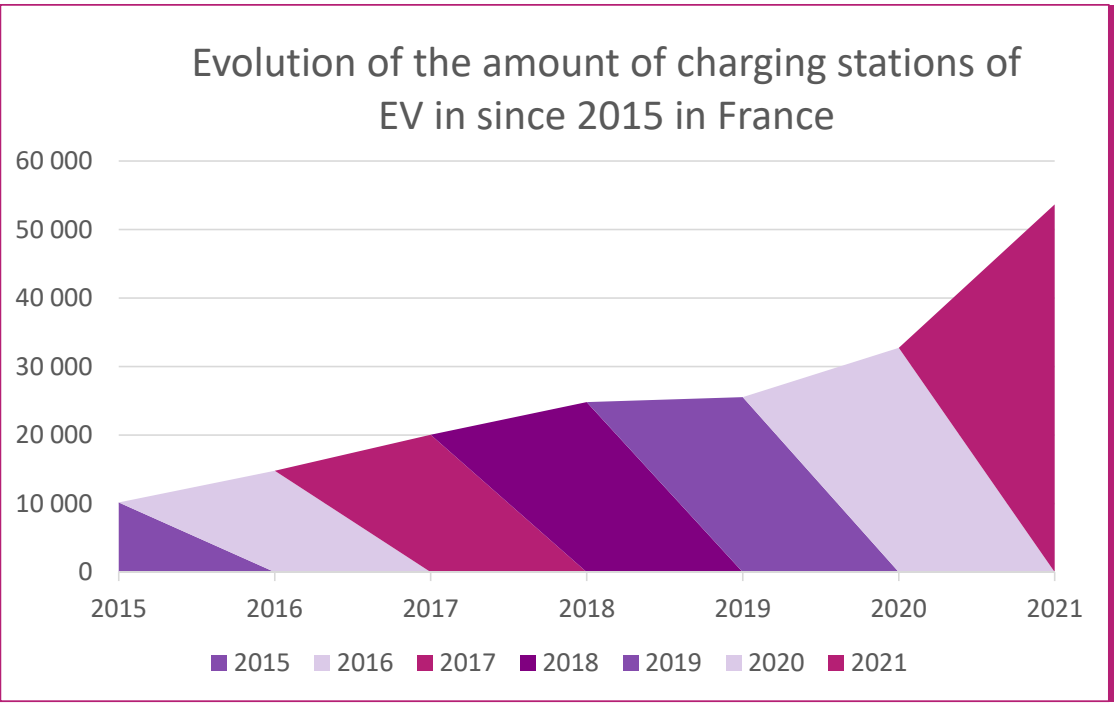
- Sites of local authorities or organizations such as AvereFrance
- Date of variable data sets, format also and sometimes not compatible with geoprocessing.
- Information that may need to be cross referenced or supplemented with other informations

2. Methods

Data.gouv	Download from the internet	Table to points	**Count points in polygons**
ChargeMap	Count of the charging stations of the interactive map	Creation of a table with amount of charging stations per town of each metropolis studied	Attribute join with a shapefile of french towns names
BDD Mouve	Download the given database	Table to points	Count points in polygons



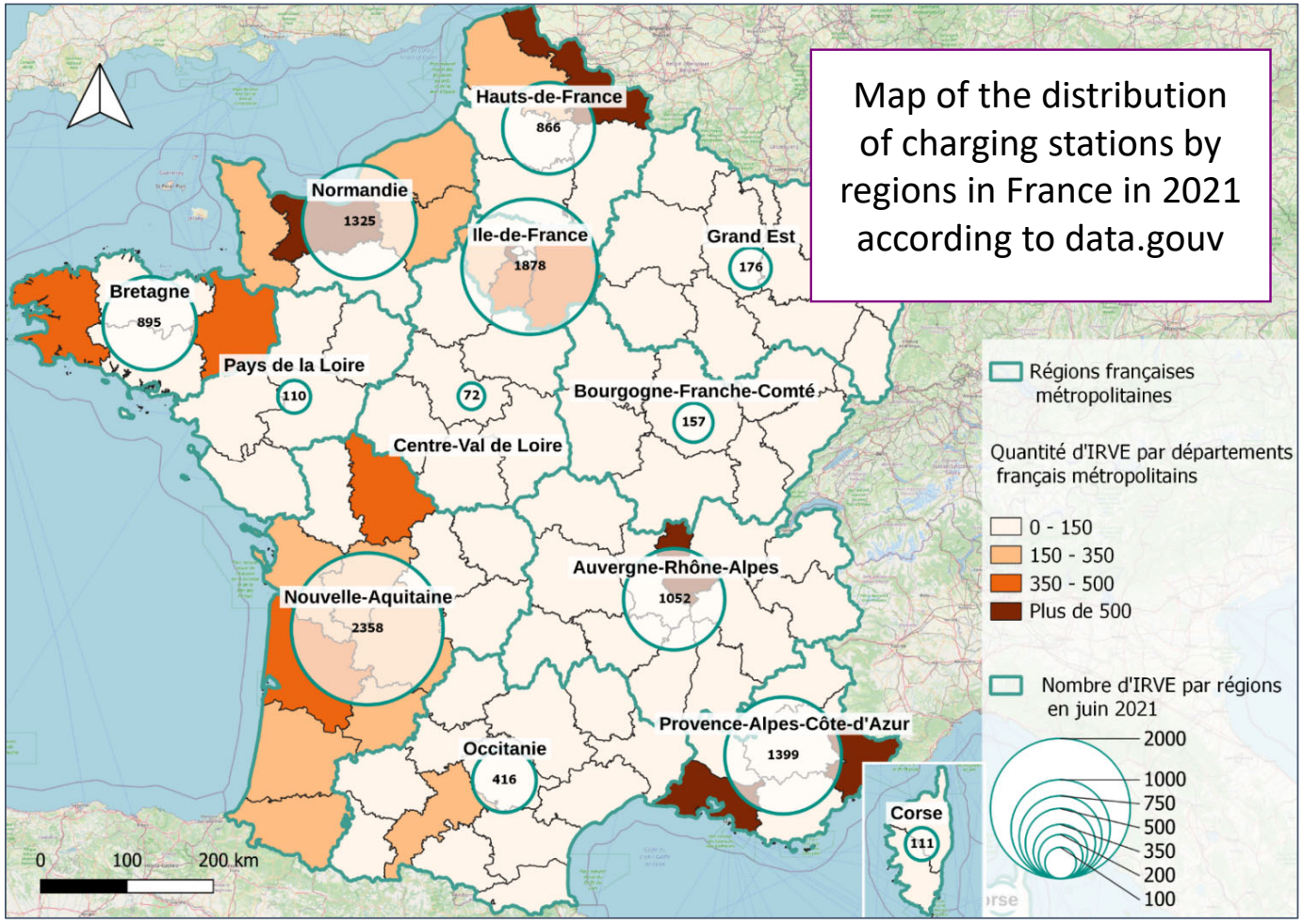
2. Methods



Evolution of the number of charging stations since 2015

In 2015 there were10,161 charging stations present in France, against 53,667 in 2021, their rate of change since 2015 amounts to 42,8 %.

3. Results

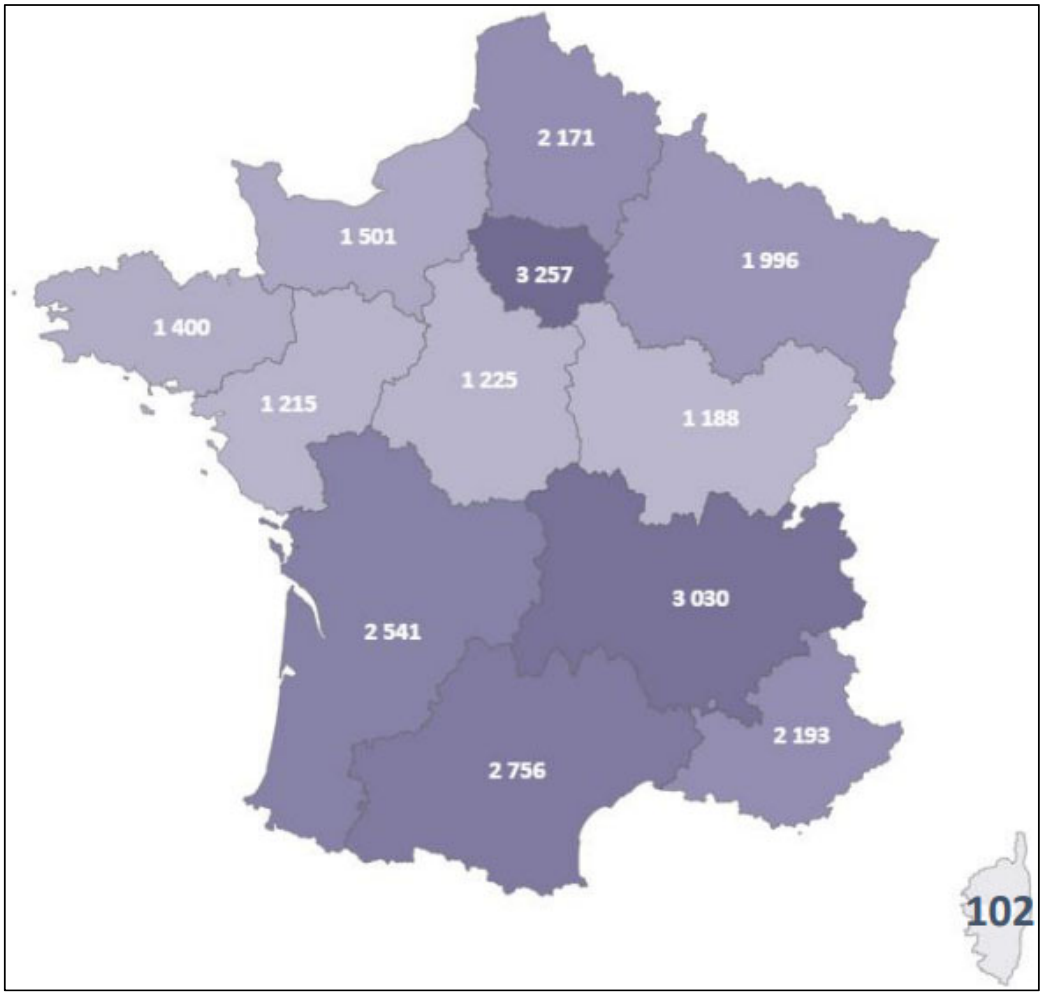


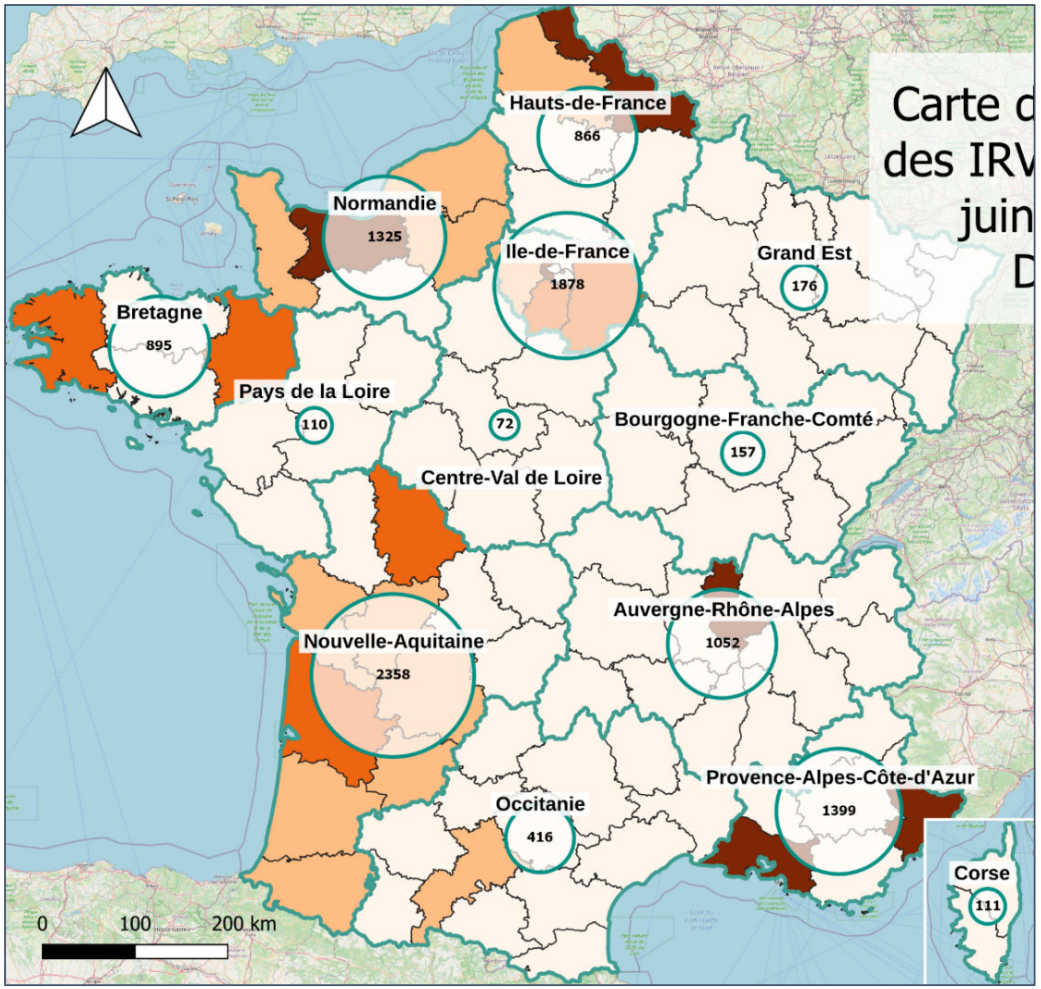
Map of the distribution of charging stations by regions in France in 2021 according to data.gouv

Available datasets for french charging stations:

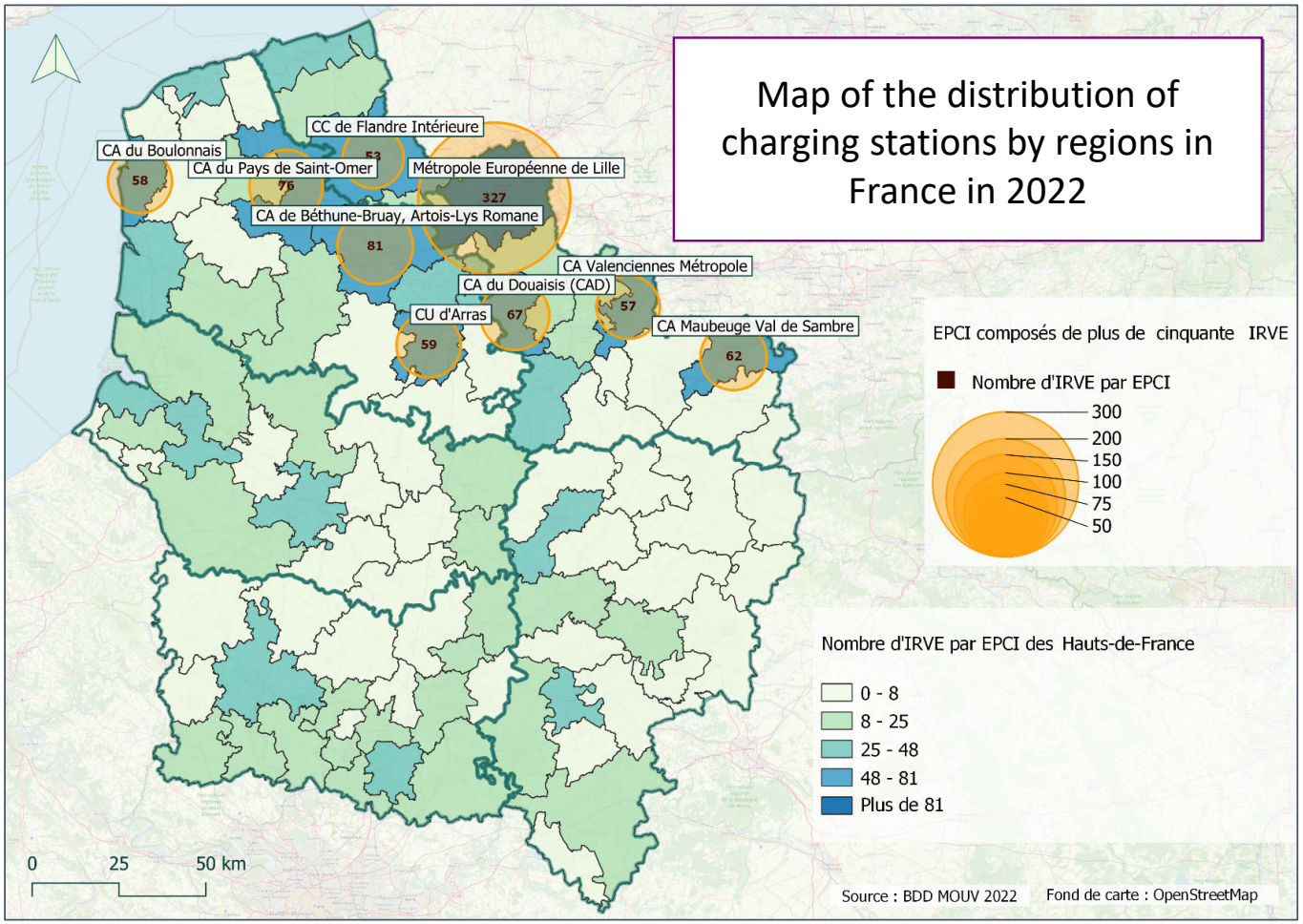
- Data.gouv
- ChargeMap
- Avere France
- Merge databases for each region for the same year

3. Results


2 171
1 501
3 257
1 996
1 400
1 225
1 215
1 188
3 030
2 541
2 193
2 756
102


Hauts-de-France
866
Normandie
1325
Ile-de-France
1878
Grand Est
176
Bretagne
895
Pays de la Loire
110
72
Bourgogne-Franche-Comté
157
Centre-Val de Loire
Auvergne-Rhône-Alpes
1052
Nouvelle-Aquitaine
2358
Provence-Alpes-Côte-d'Azur
1399
Occitanie
416
Corse
111
0
100
200 km

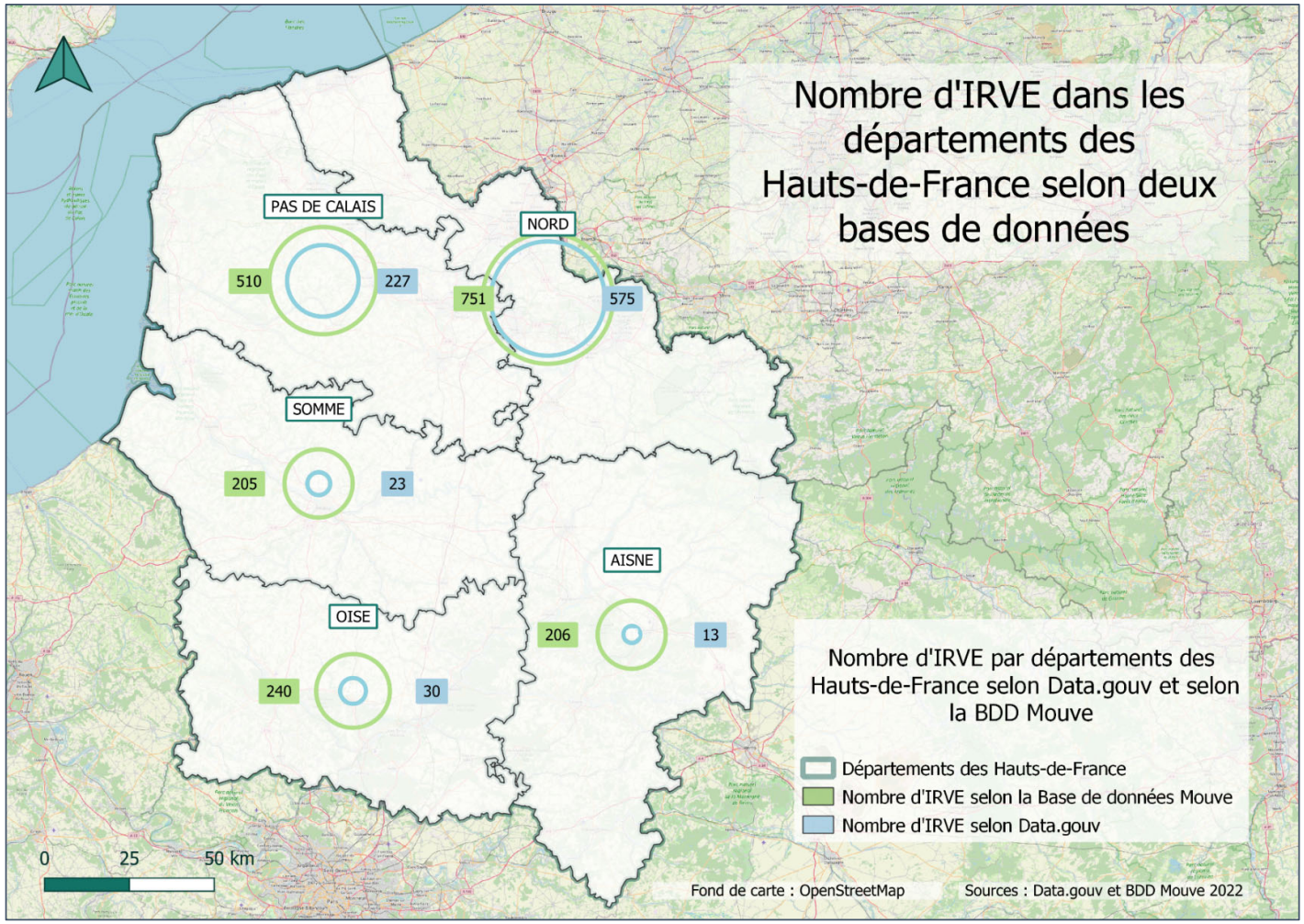
3. Results



Données disponibles pour les Hauts-de-France:

- Data.gouv
- ChargeMap
- BDD Mouve
- Avere France
- Merge databases for each region for the same year

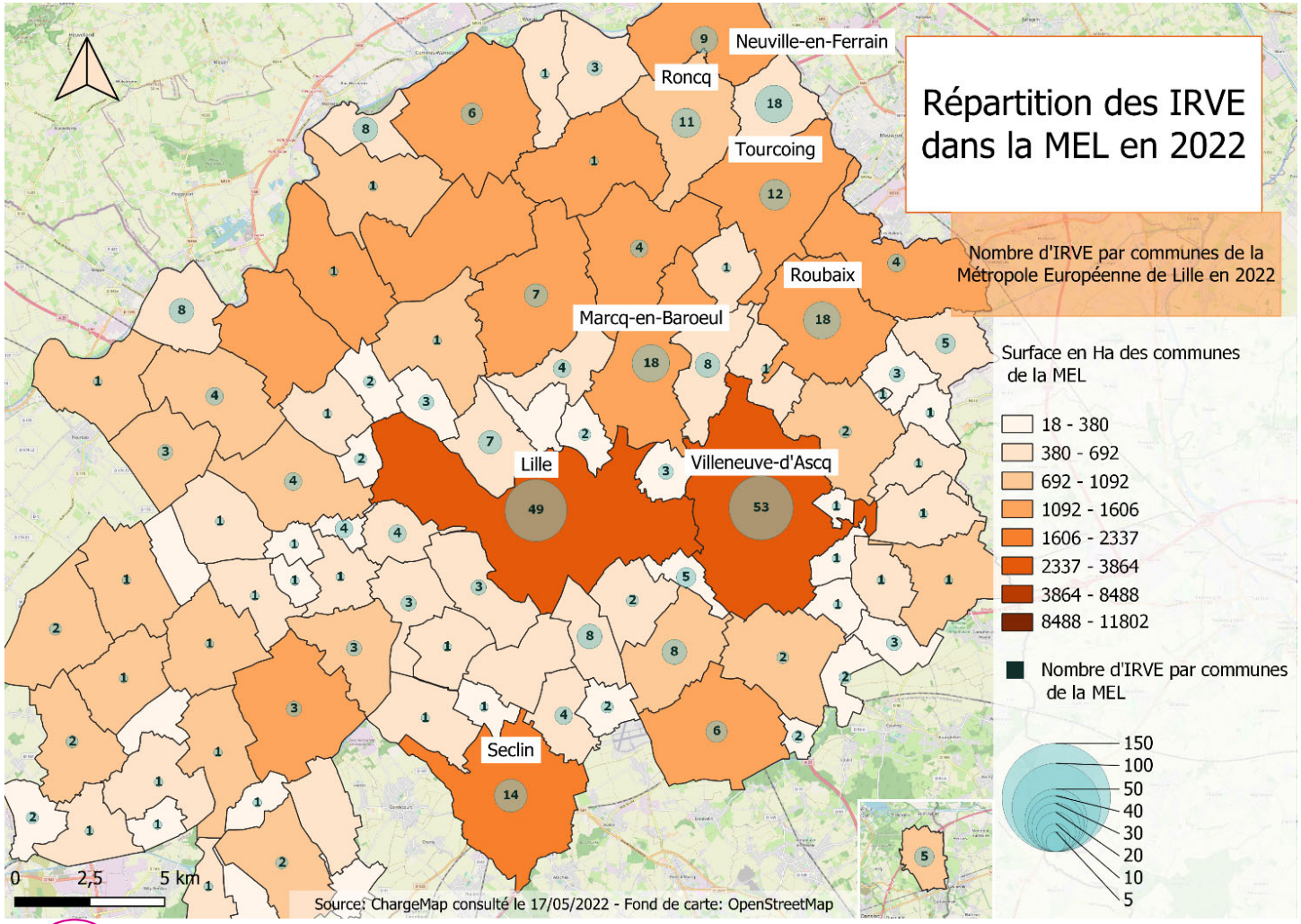
3. Results



Data.gouv dataset for June 2022 :

- Aisne : 14
- Somme : 25
- Oise : 32
- Pas-de-Calais : 230
- Nord : 583

3. Results

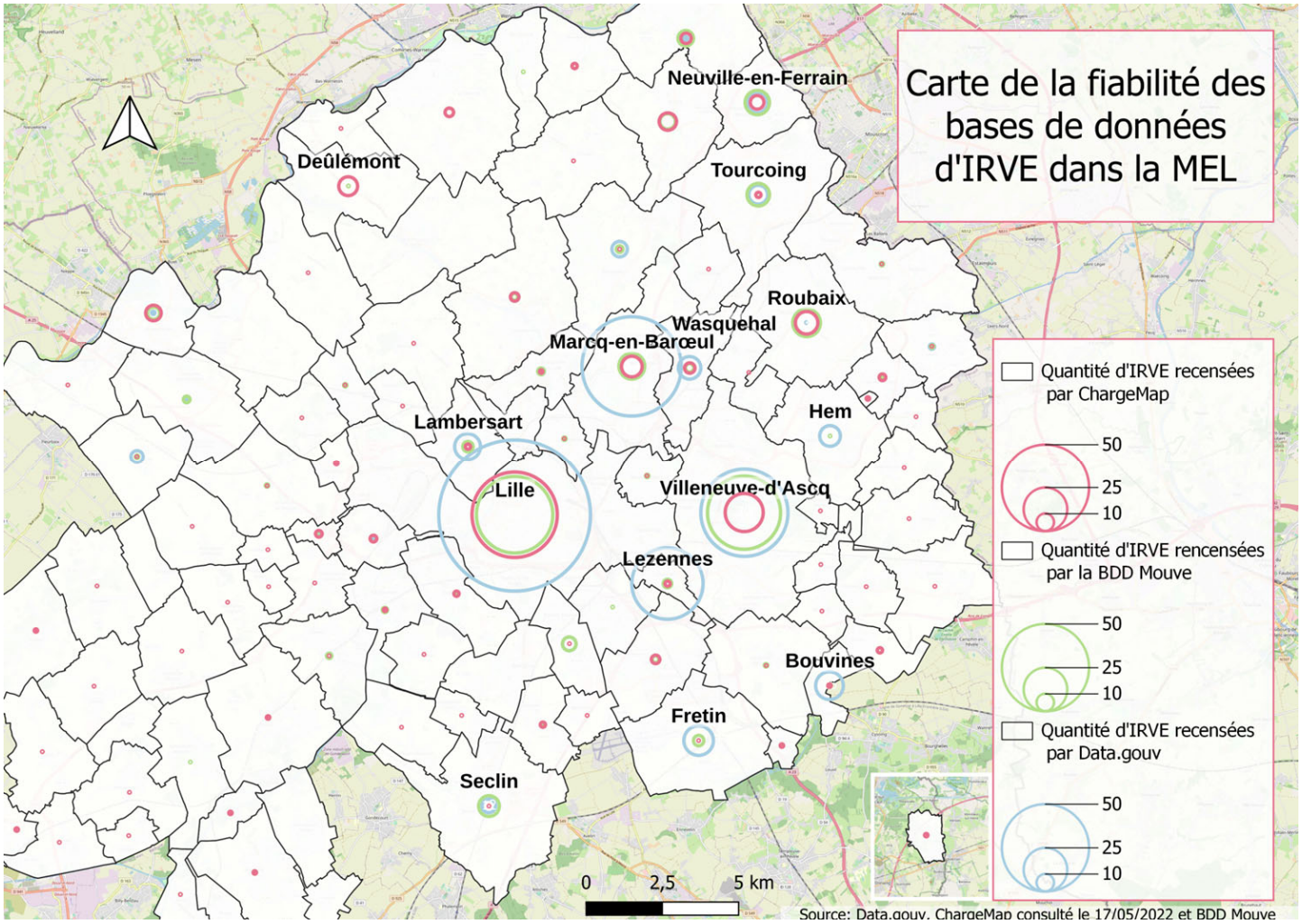


MEL (Métropole Européenne de Lille)

- **408** charging stations
- **95** towns
- **671,9 km2**
- **1 146 320** inhabitants

An average of 4 charging stations per town and a potential 2 809 users per station

3. Results



Data available for metropolitan areas:

- Data.gouv
- ChargeMap
- BDD Mouve
- Number of charging stations listed on the sites of each metropolis (and sometimes interactive maps or databases)

3. Results

	Lille	Bordeaux	Lyon	Toulouse	Rennes
Year of commitment to e-mobility	2015	2010	2013	2013	2010
Metropolis' Websites	440	540	641	115	110
Chargemap	408	294	393	268	103
data.gouv.fr	404	37	664	31	90

Conclusions

- Electromobility has never combined so many elements in favor of its development since its creation, now it needs the support of economic actors and a more developed charging stations network to be able to keep on developing so quickly.

- In order to better quantify the progress of electromobility and the electric vehicle charging infrastructures network, more precise data collection methods for these charging stations could be elaborated.

- Indeed, the available public databases sometimes disagree, which leaves a margin of error in the identification of charging stations at several scales. Nevertheless, all of these databases show an increase in EVRI since the past decade.

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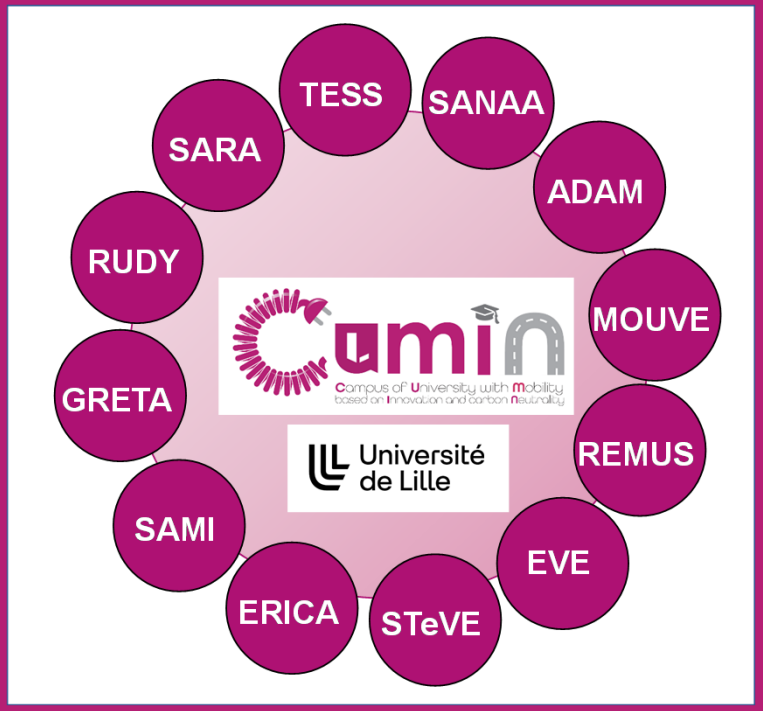

CUMIN programme

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an exciting living lab
towards eco-cities!