



EVs must happen

To allow the electric vehicle
to happen this time

Infrastructure must be :
Simple
Economic



CHANGER L'ÉNERGIE ENSEMBLE

To make the Electric Vehicle an acceptable solution it must be :

- Simple to use**
- Reasonable investment**
- Readily available**
- Low cost infrastructure**
- Interoperable**

To make infrastructure available we must :

- ▶ Minimize the cost
- ▶ Put in the infrastructure that will be used
- ▶ Put the infrastructure where it will be used
- ▶ Put in infrastructure that will use electricity at the right time

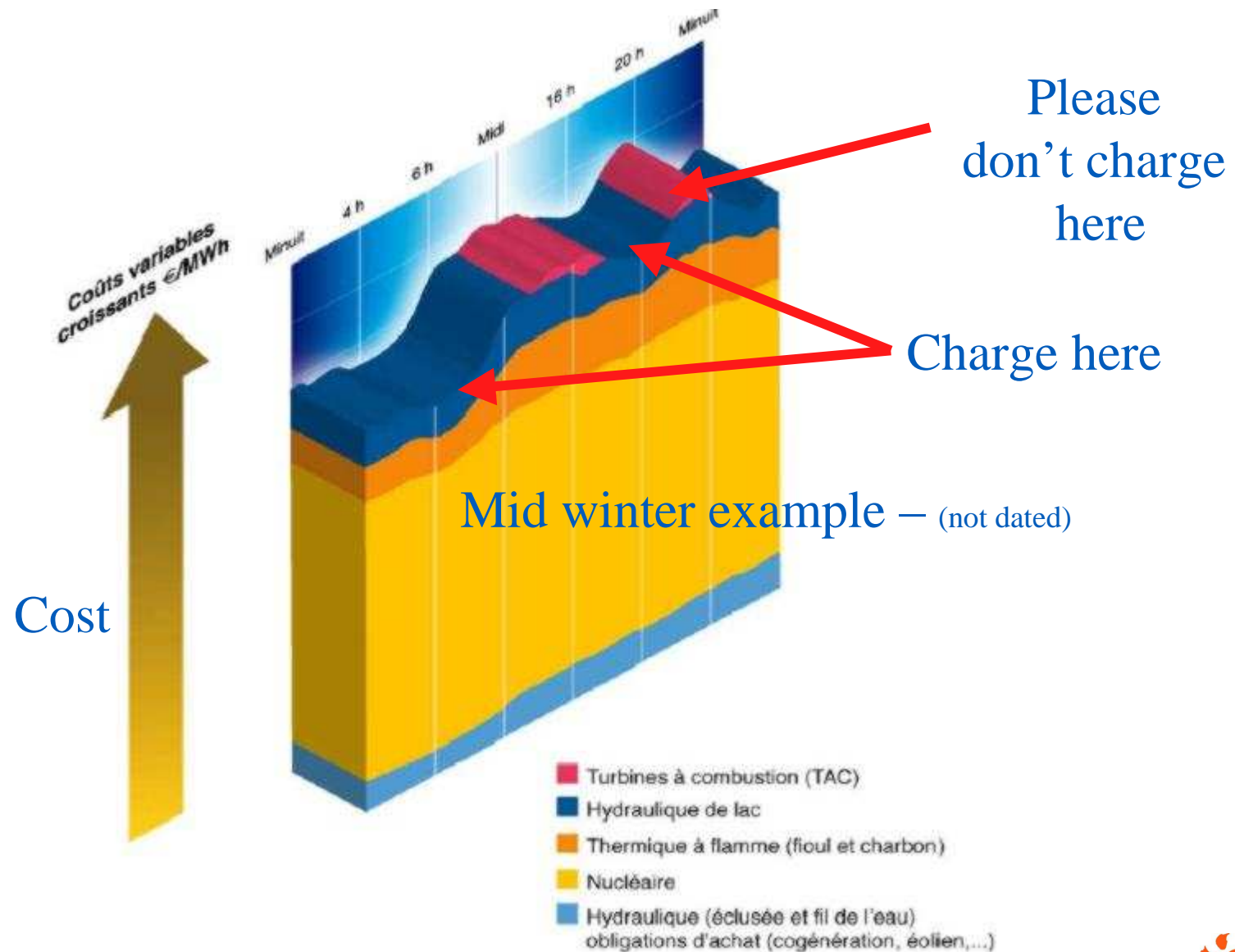
Past experience has shown low usage rates for public infrastructure

Infrastructure should best be placed at home or in the office depot to use night electricity

Cars spend 90% of their time in a parking places.
There is therefore plenty of time to do slow charging (3 kW) at the most advantageous time in terms of cost and CO2

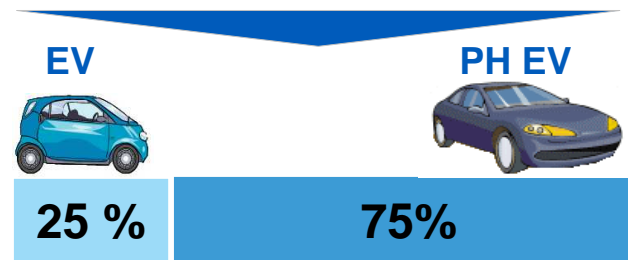
Low power charging at off peak times best uses available resources and limits investment

In the future we may wish to orientate the client to chose the optimum charging time for cost and CO2

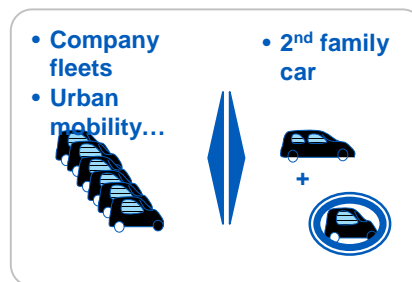


2- Vision future French EV and PHEV fleet

The following breakdown was estimated during seminars organized by the French Administration

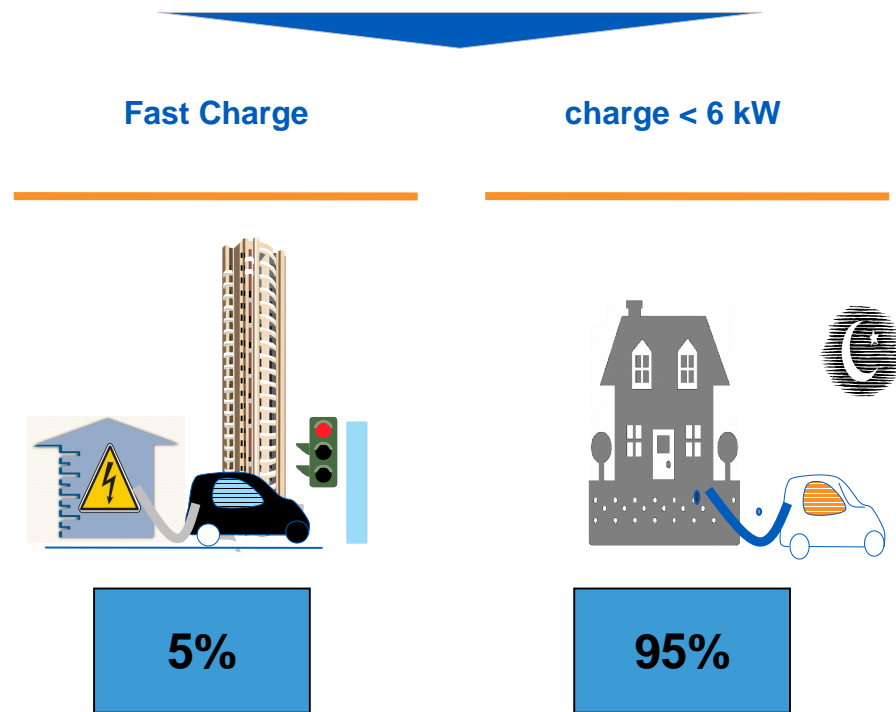


EV : A « Niche » market PHEV : A « mass » market



Fast charge and curb-side charge will only concern 5% of total energy

Most charging will be done at home, at the office, in public parking areas
Most charging will be slow (3 kW charging will probably dominate)



Fast – Expensive
Few

Overnight – cheap – efficient
available everywhere

A lot of curb side infrastructure already exists It is simple and practically all 16A 230V

Mendrisio



France



Gifas in Florence
Standard IEC 309 plug
3 pins (no pilot wire)



Progetti for Zincar
(Milan 42 charging points)



Elektrobay : EDF Energy - London



Park and
Drive



Inefficient billing will increase the cost to the client

- ▶ Electricity costs 2€ per charge at the most,
(with a 50c to 1 € average per day for a client at 15000 km/year)
- ▶ Most charging will be done at home with the home meter or in the company depot. This is the best solution.
- ▶ Electricity could be included in the parking cost and not be billed separately.
- ▶ Roaming is possible but will only concern a very few clients and would concern minimal energy. It could add unnecessary cost for the client

As an extreme example of roaming :

A client in Spain could wish to buy night time electricity from Danemark.

The final cost to the client should include transport costs and the billing transaction for this very low cost item.

Interoperability : the unified European Plug

The Unified European Plug must be

- ▶ Economic
- ▶ Accepted by all European countries
- ▶ Satisfy all safety regulations

Interoperability : the vehicle to charge spot information system

- ▶ The system must be simple and compatible for all Europe
- ▶ It should be designed for real needs (eg : load control)
- ▶ It should take into account the work done on smart metering and smart grids and be realistic in its objectives.
- ▶ The system must not add unnecessary cost to the vehicle or charge station
- ▶ Vehicles without such information systems should not be excluded but should operate with basic minimal services.

Ongoing experiments will show the way

- ▶ Many test programs are now being carried out with the major OEMs
 - ▶ Past experience in the 1990's has shown that much infrastructure was not really used or adapted
 - ▶ New experiments will show the pertinence of the choices
-
- ▶ Conclusion : we must learn from our past experience and give simple, convenient and cheap systems to our clients.