



# Industrial Revolution in Hauts-de-France

way to achieve energy transition  
at the local scale ?



LA 3<sup>ÈME</sup> RÉVOLUTION INDUSTRIELLE  
EN HAUTS-DE-FRANCE

# The Third Industrial Revolution

- An industrial revolution (according to J Rifkin): a confluence between an energy source and an mean of transport and/or communication
- After the coal era and the rail (1 revolution)
- After the oil age, cars and mass medias (2<sup>nd</sup> revolution)
- The era of renewables and digitalization (3rd revolution)
- Based on 5 pillars together : renewable energies, buildings as micropowerplants, hydrogen as a storage solution, infrastructures of electrical transportation, internet as way to better manage all theses ressources (IOT)

# Regional context



- In Nord Pas de Calais, work initiated by D Percheron (president of the regional council) and P Vasseur (Former Ministry, president of regional chamber of trade and industry) with J Rifkin in 2012 to define a regional roadmap for energy transition, climate mitigation and new economy
- Still an industrial region (with a industrial history - former biggest french mining area-) with car industries, steelworks, biggest nuclear power plants in Europe...
- A new regional area and institution : Haut-de-France in 2016 (6M habitants), fusion of former regional institutions Nord-Pas de Calais (4M) and Picardie (2M)
- Confirmation of TIR Objectives by the new elected assembly and president and the will to promote TIR for local employement
- National obligations : Evaluation of the former regional scheme on energy (SRCAE - 2012) and elaboration of the new scheme (SRADDET - 2019) in progress

# Governance of the dynamic TIR and calendar



- Governance with multiple stakeholders :
  - ➔ Préfecture des Hauts-de-France
  - ➔ Regional Council des Hauts-de-France
  - ➔ Chamber of Commerce and Industrie
  - ➔ Mission REV3
  - ➔ Regional Direction ADEME
- Two studies initiated in 2017 :
  - ➔ What are the current trends and technical scenarios for the TIR at the new regional scale HdF ?
  - ➔ Which consequenceq in terms of economic activities, jobs and employmement ?
- Work in progress (preliminary results presented the 23rd january to the local stakeholders - NGO, institutions, energy companies, network companies, steelworks...-) and final publication in May 2018)
- And further development in 2018, 2019 on circular economy, ressources consumption, bioeconomy, financial tools and additionnal policies and financial ressources

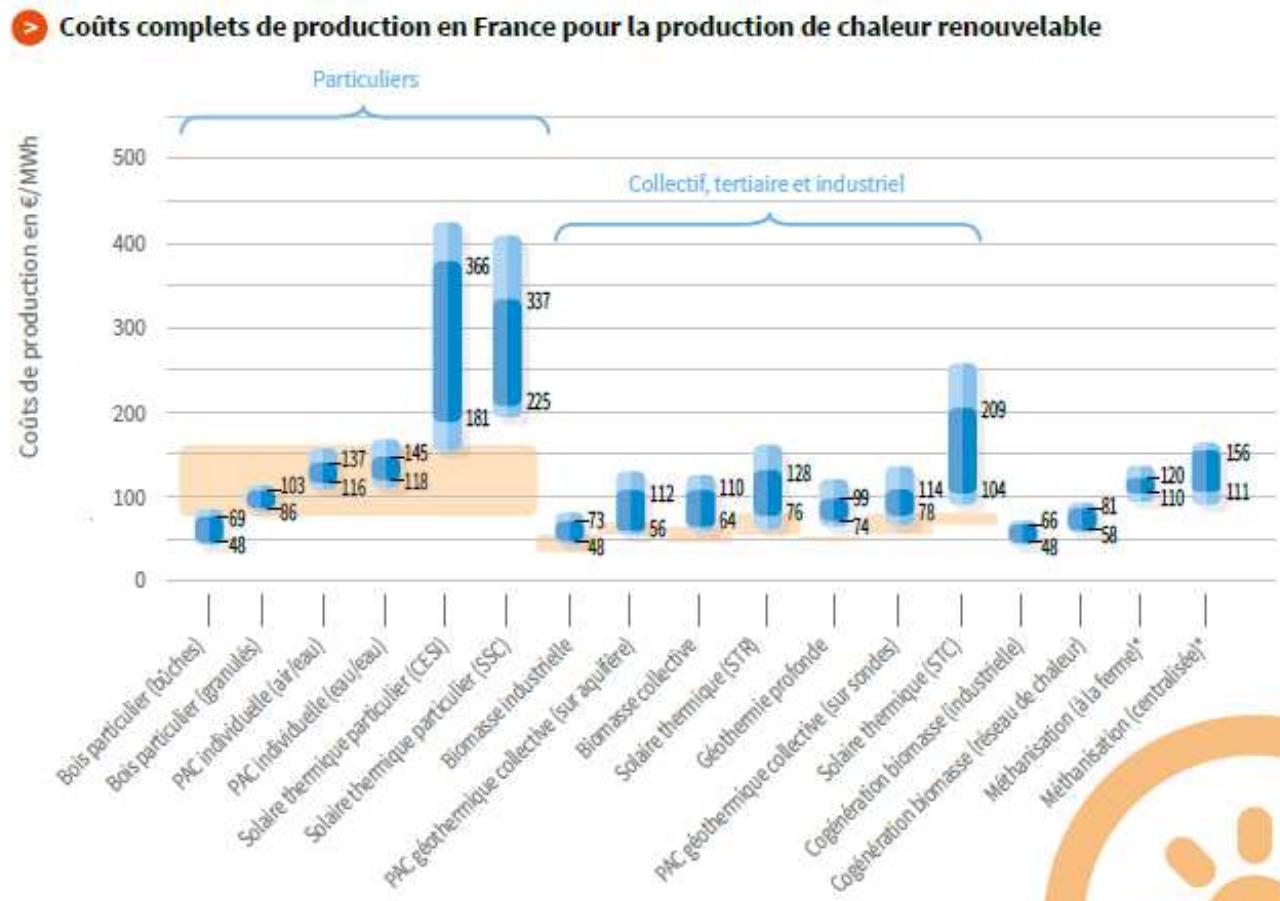
# Objectives of the studies

- « Results » five years after the work done with J.Rifkin
- Define actualized scenarios to reach the same objectives as defined in 2012 but at the new scale HdF (60% consumption reduction, 100% renewable energie)
- Not self-sufficiency but energy autonomy (annual balance), as subsidiarity : all we can do here, let's do it
- Translate these scenarios in physical activities indicators (m<sup>2</sup> build, refurbished, windmills installed, m<sup>2</sup> of solar panels installed, km of heating network build, cars solds, km travelled,...)
- Evaluate the impacts in terms of activities, formation and jobs at regional scale

# What's new compared to five years before, when the TIR was initiated ?



## ● Competitiveness of renewable energies (heat and electricity)



- Law TECV in 2015, COP21 (Paris Agreement)...
- End of life of the oldest nuclear power plants in the next decades (uncertainty of future availability production)

- Increase of the carbon tax in 2018 (compared to the previous trend)

Trajectoire d'évolution de la taxe carbone pour les années 2018 à 2022

(en euros par tonne de CO<sub>2</sub>)

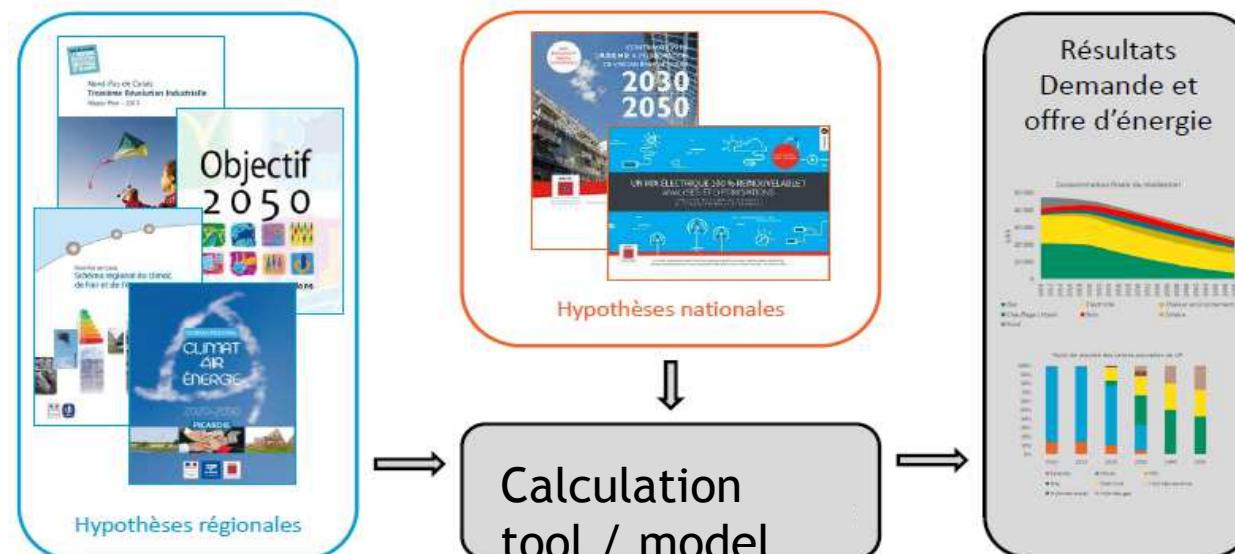
	2018	2019	2020	2021	2022	2030
Loi relative à la transition énergétique pour la croissance verte	39	47,5	56	-	-	100
PLF 2018	44,60	55	65,40	75,80	86,20	-
	+ 14,10	+ 10,40	+ 10,40	+ 10,40	+ 10,40	-

Source : loi relative à la transition énergétique pour la croissance verte et PLF 2018

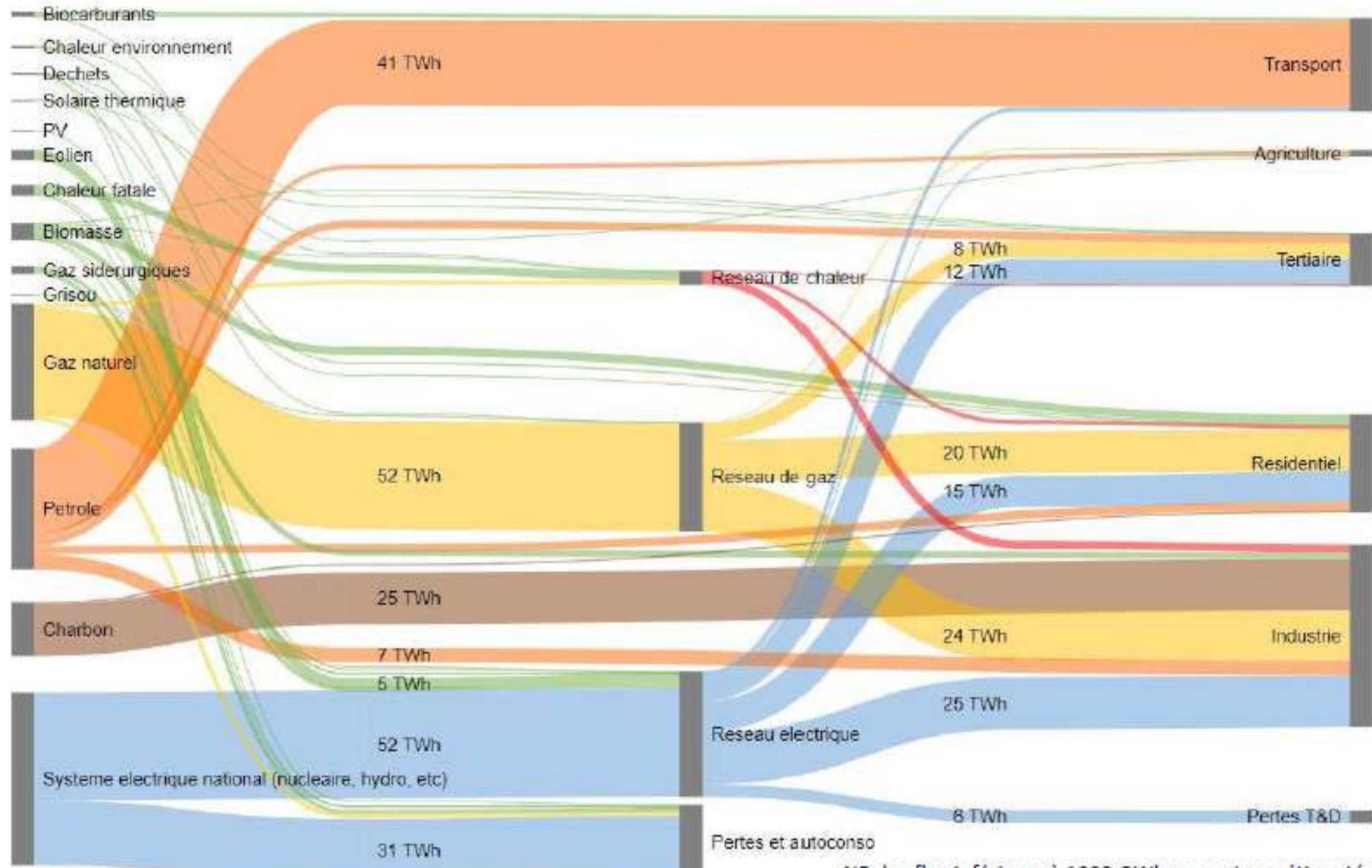
- Reduction of speed limit on national roads at 80km/h (vs 90km/h)
- End of exploitation of hydrocarbures in France en 2040
- End of sales of oil vehicle announced in 2040

# Methodology

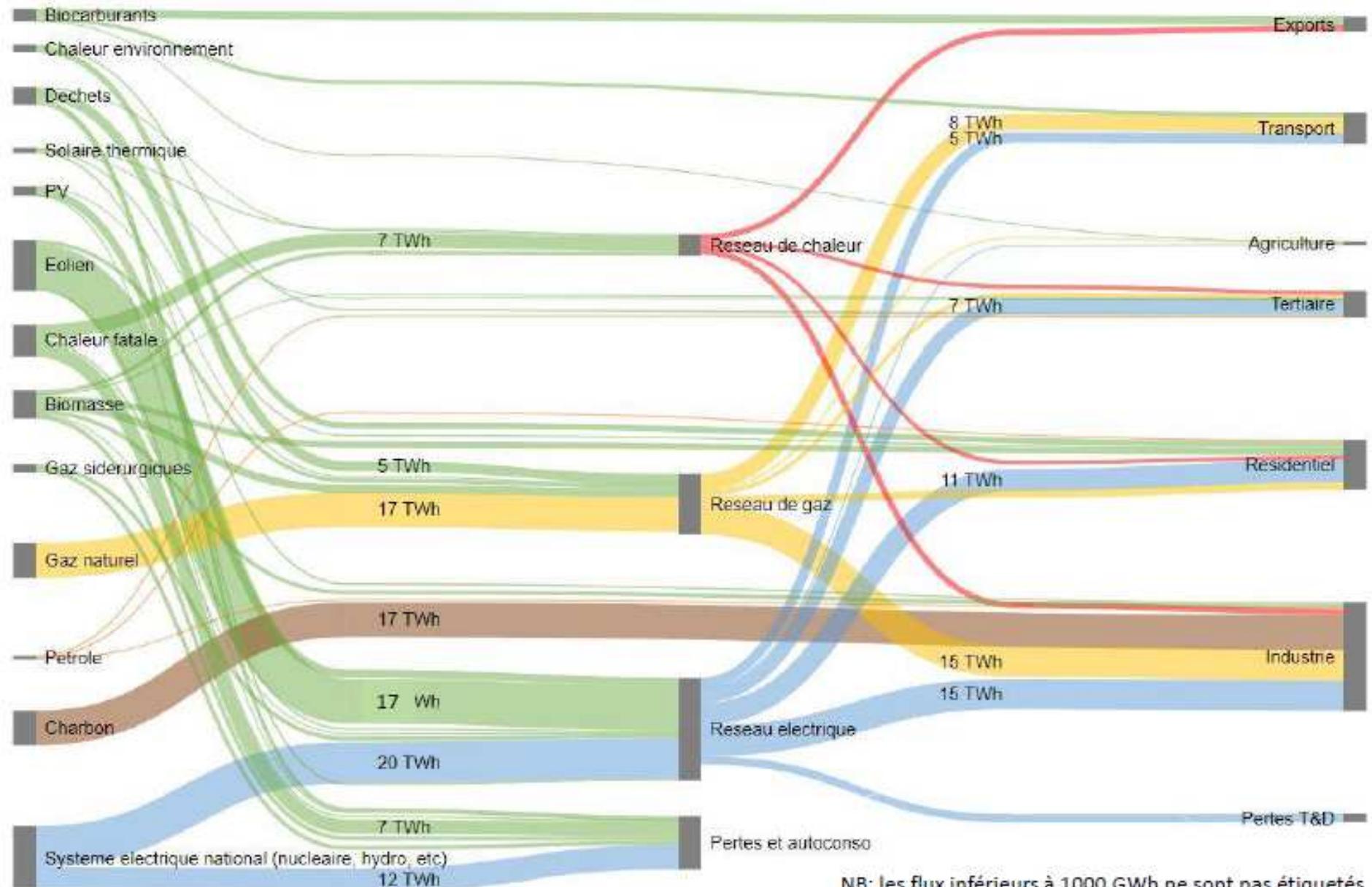
- New regional visions considering the last regional energy plans (Picardie and Nord Pas de Calais - SRCAE 2012 - & the new SRADDT)
- Keep the two main objectives set in 2012:
  - Decrease of consumption of 60%
  - Consumption covered by renewable or fatal energy
- Describe technical roadmap and complementarity between industries (ex : RE and VE, H2 production...)



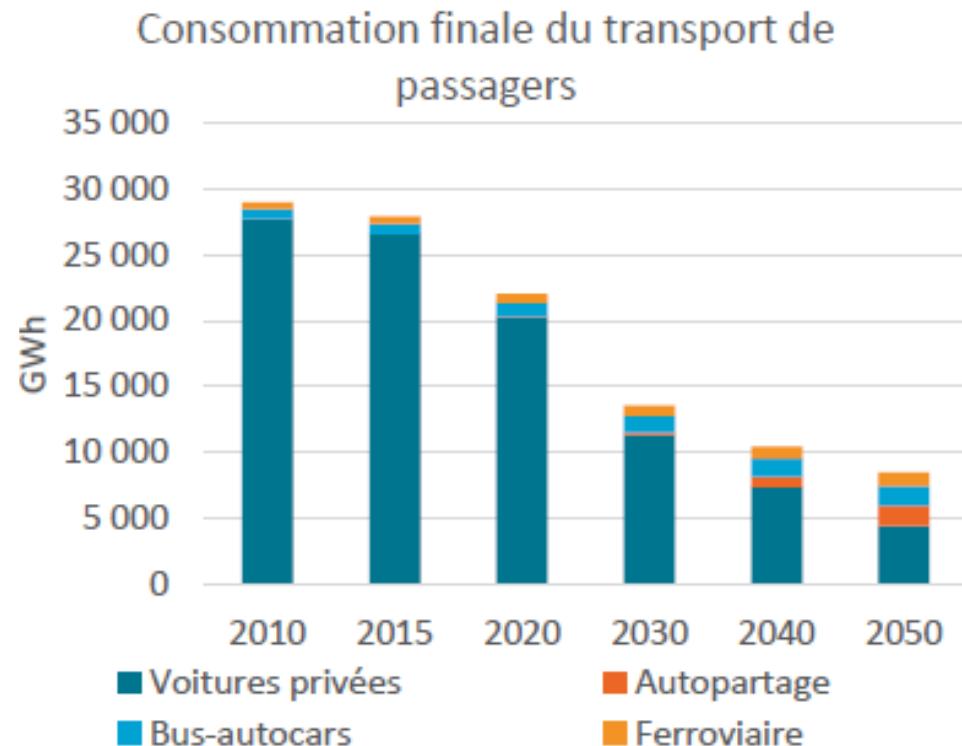
# Regional energy system in 2015 : a centralized system



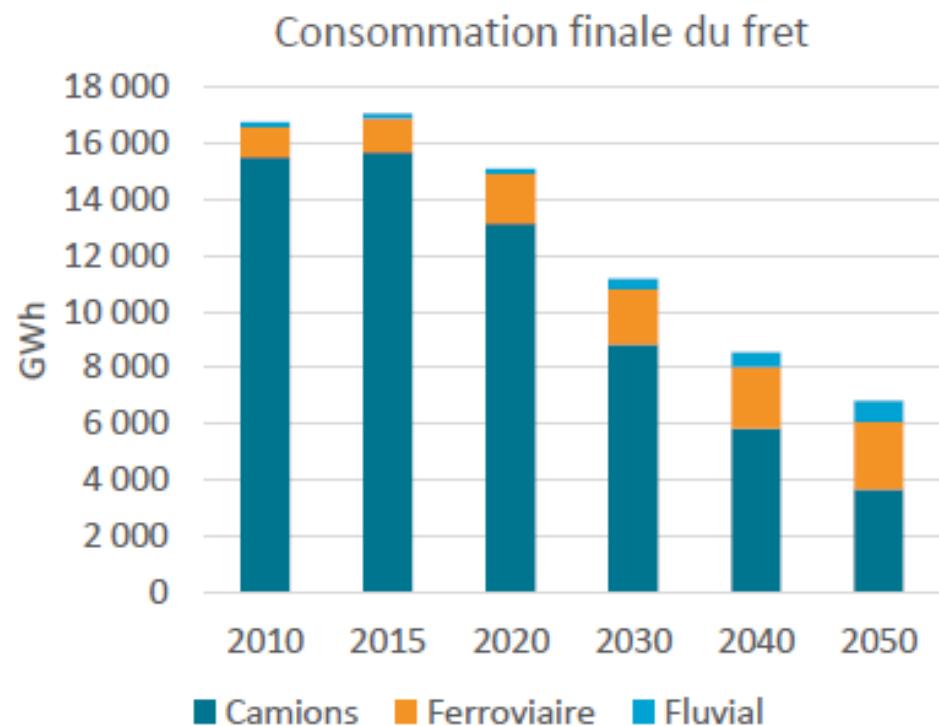
# Régional energy system in 2050 : a (partly / mainly) decentralized system



# Example : Demand of transport sector



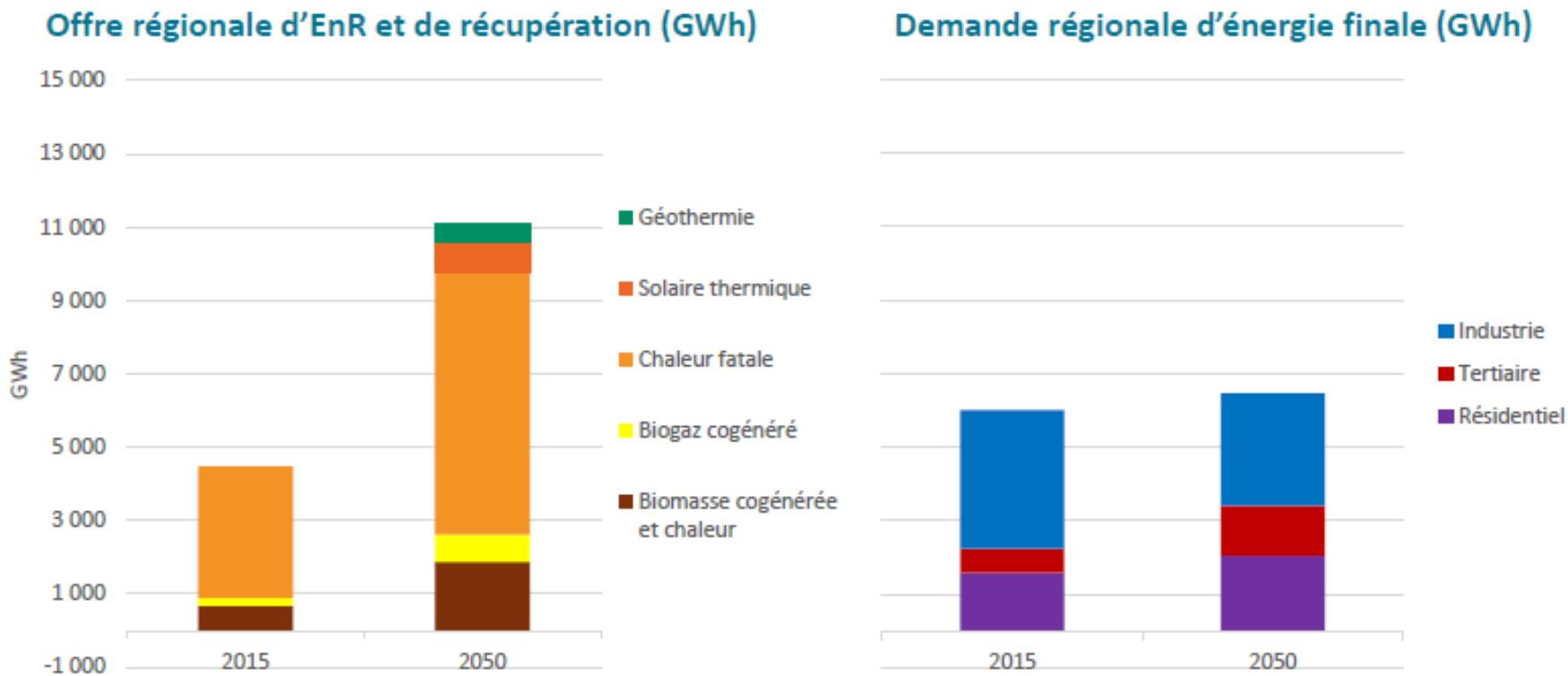
NB: voitures privées incluant covoiturage



# Example : Heat potential and demand



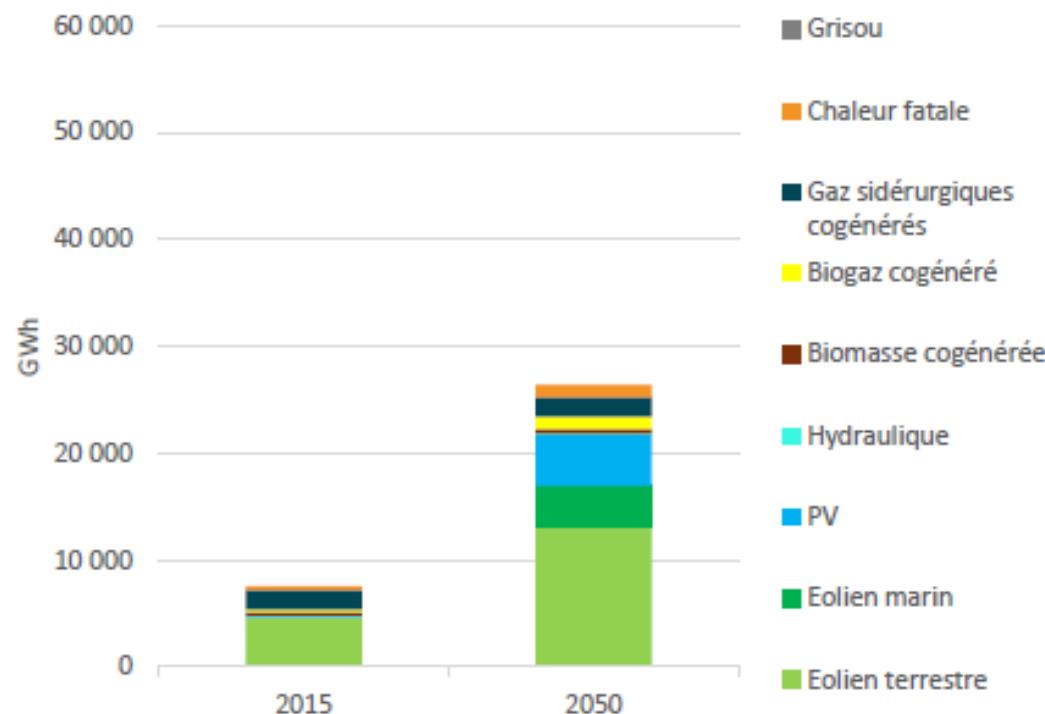
## More potential than needs



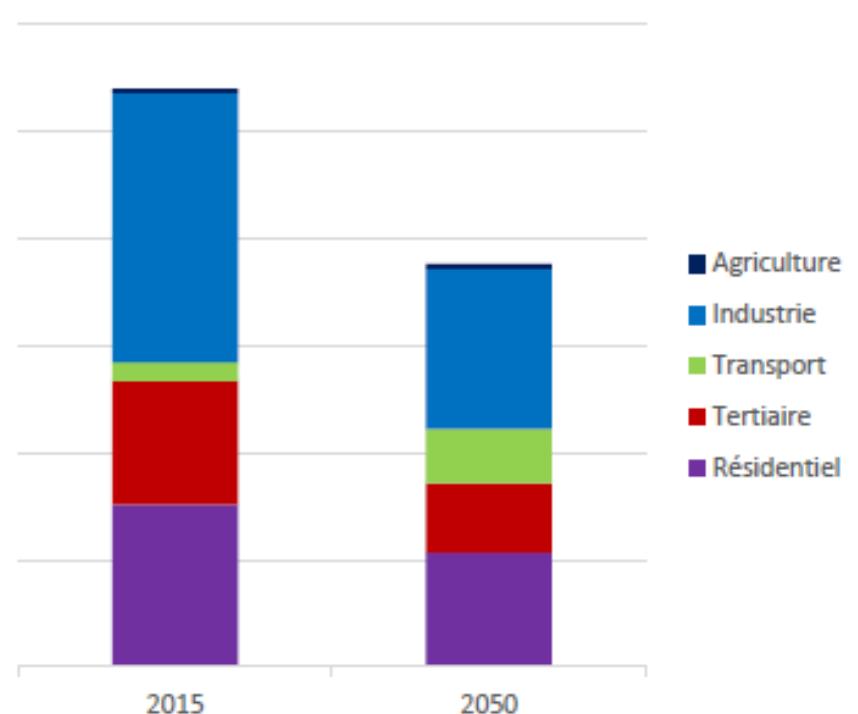
# Example : Focus on electrical production and demand



Offre régionale d'EnR et de récupération (GWh)

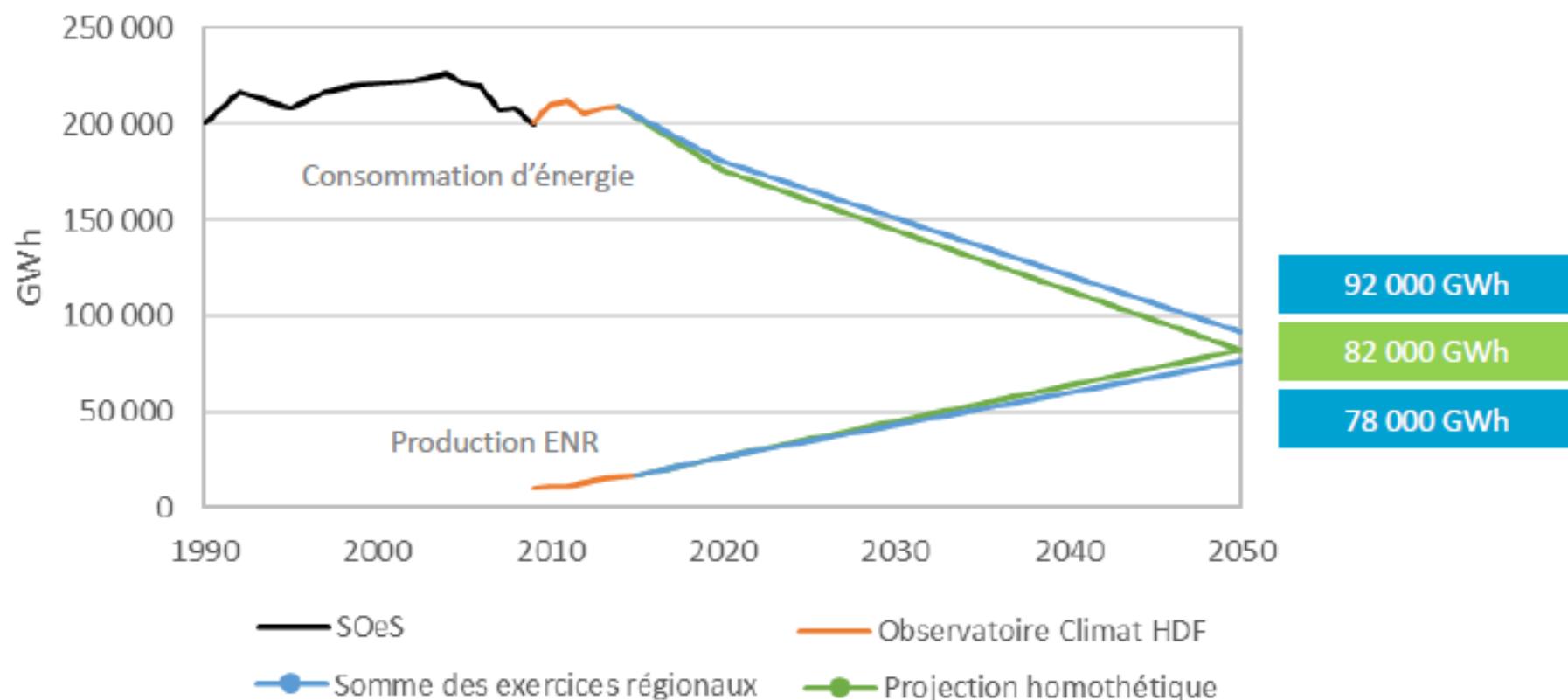


Demande régionale d'énergie finale (GWh)



## Preliminary global results on energy scenario

- First teachings : good dynamic on renewable energy production, not on energy consumption (stabilization and no decrease)

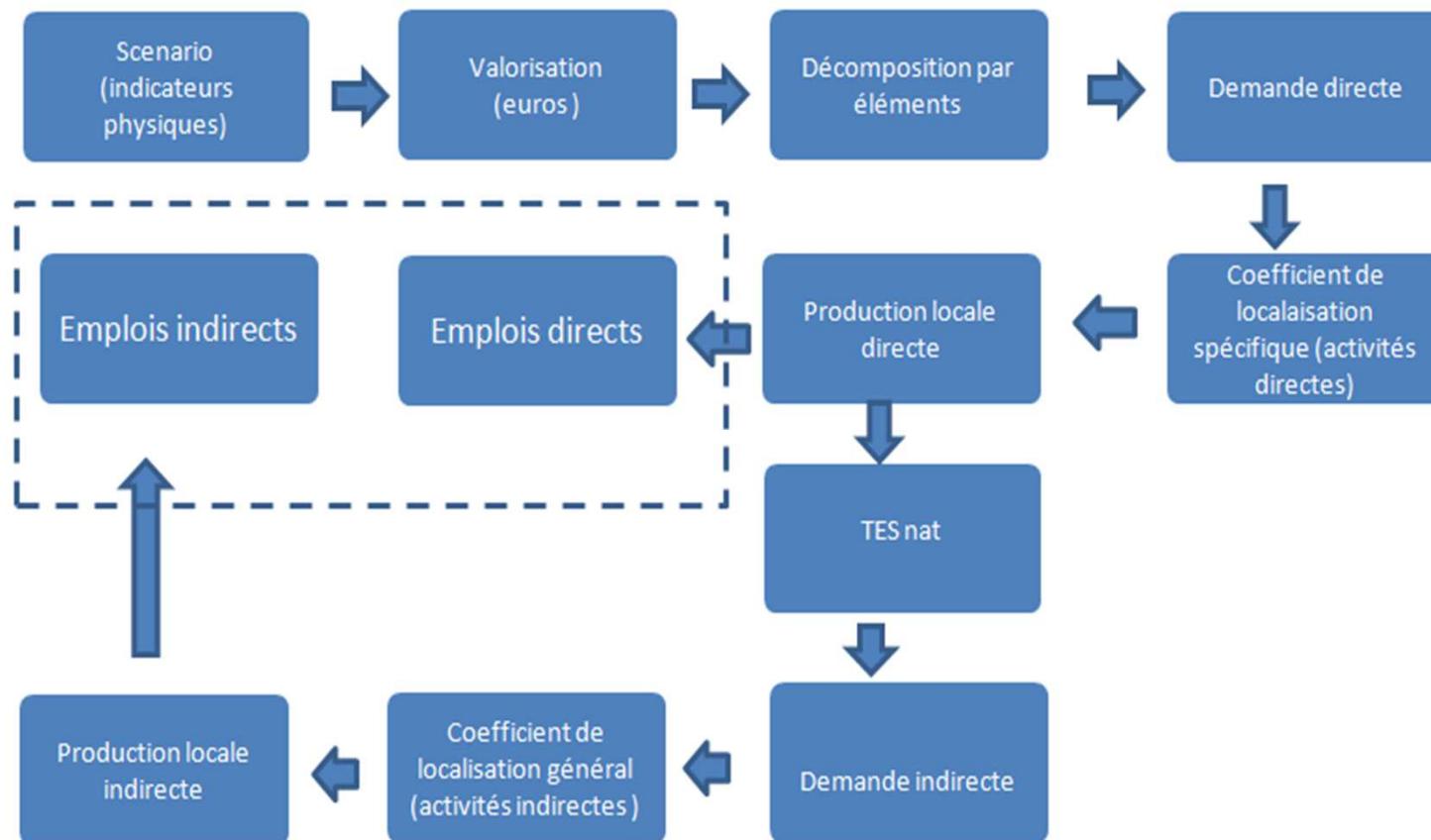


# Evaluation of consequences in terms of jobs, skills and formation



- **Quantity issues :**
  - ➔ How many jobs « needed »
  - ➔ How many jobs « lost »
- **Quality issues :**
  - ➔ What kind of jobs
  - ➔ Which Needs in formation for new or current jobs (ex farmer for methanization)
- A understandable and useful methodology for stakeholders and industries
- But not a macro economic evaluation

# Méthodology



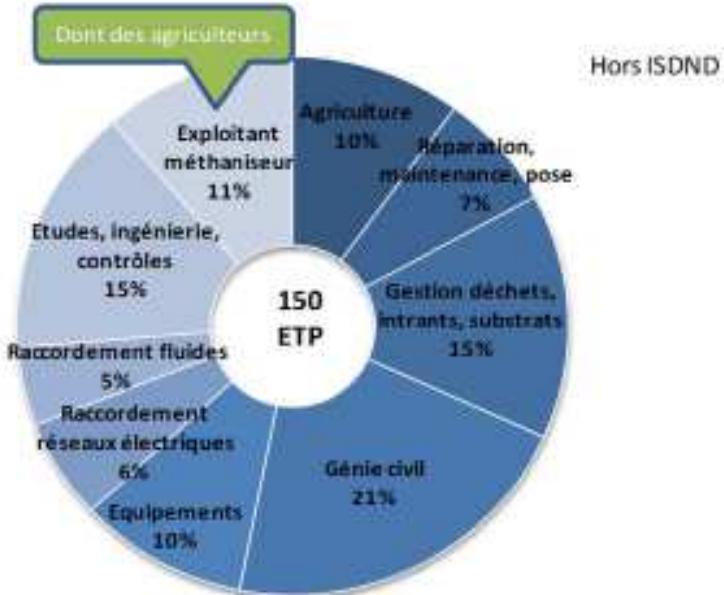
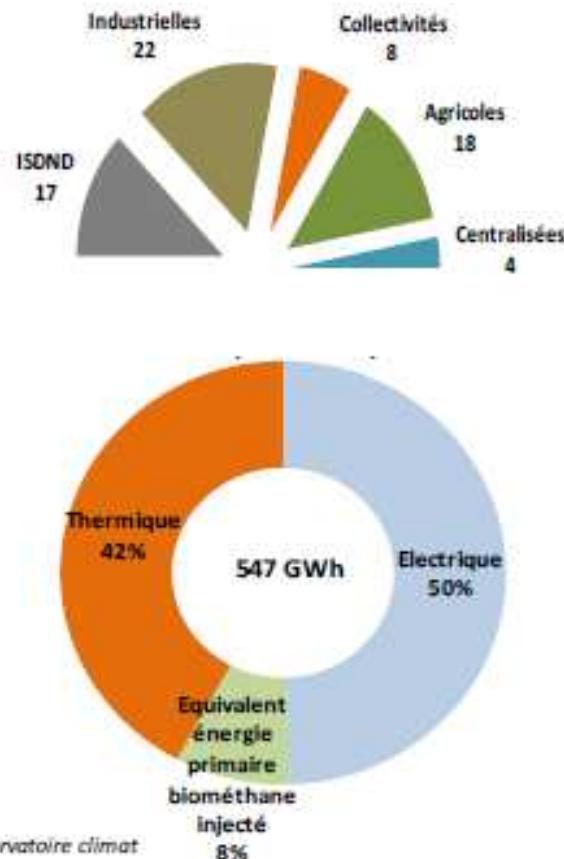
# Location coefficient



	Coefficients pour les équipements	Coefficients : autres activités
		...
<b>Eolien terrestre</b>	25% (mâts, autres équipements électriques); Autres équipements 0%	100%
<b>Eolien maritime</b>	25% autres équipements électriques ; reste des équipements : 0%	Installation 50%
<b>PV</b>	Panneaux, onduleurs, 0% ; équipements électriques 10 à 40%	100%
<b>Chauffe eau solaire</b>	10% équipements, 40 % annexes	100%
<b>PAC</b>	10%	100%
<b>Bois ménage</b>	10%	100%
<b>Méthanisation - cogénération</b>	25%	50 à 100%
<b>Méthanisation - injection</b>	40%	80 à 100%

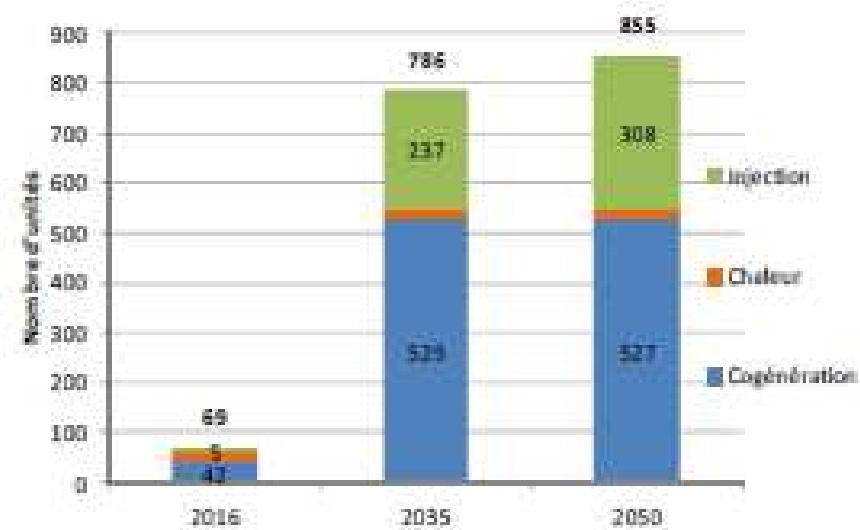
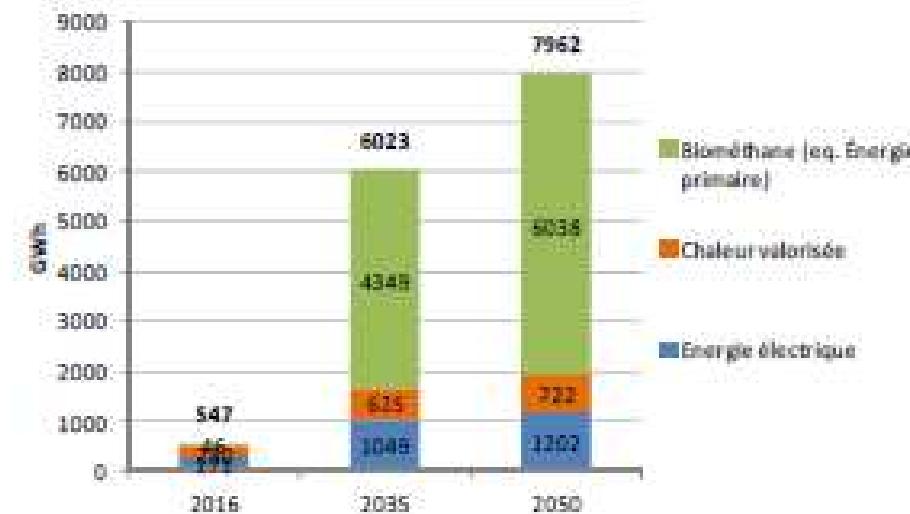
# Example of a focus : Preliminary results on methanization

*Environ 300 ETP liés à la méthanisation, dont 200 directs*



**Emplois directs :** études et construction des installations, fabrication des équipements, transports et suivi des intrants, cultures intermédiaires spécifiques, emplois sur site, gestion des digestats, maintenance

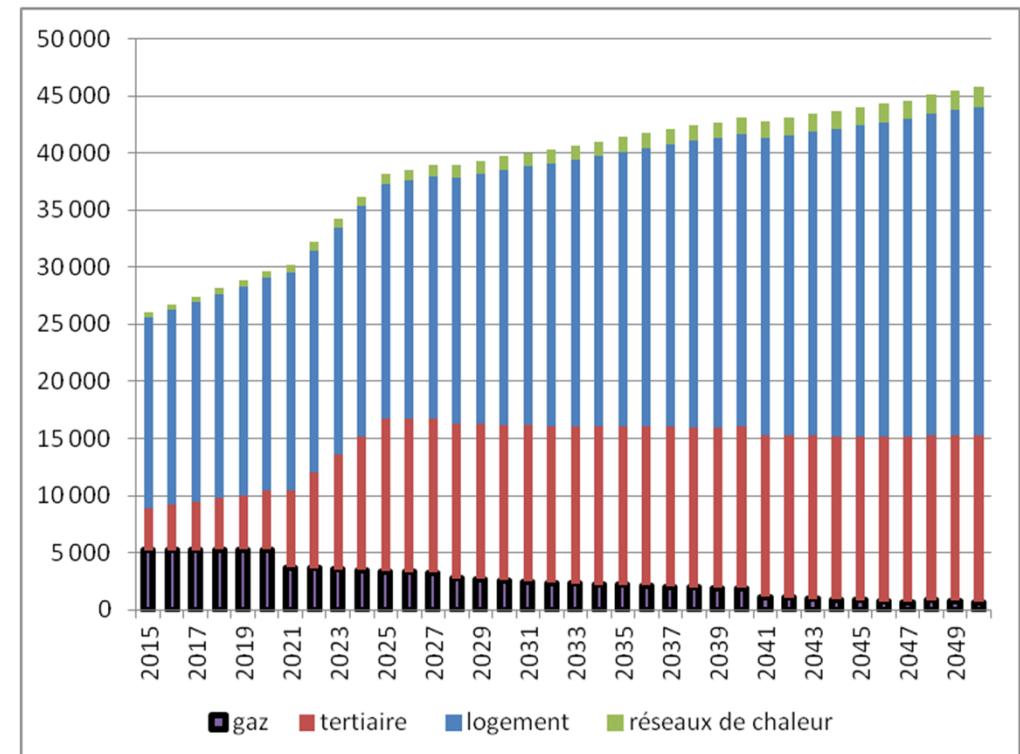
## ● From 70 to 850 units of methanization



# Preliminary results on housing (2018-2050)



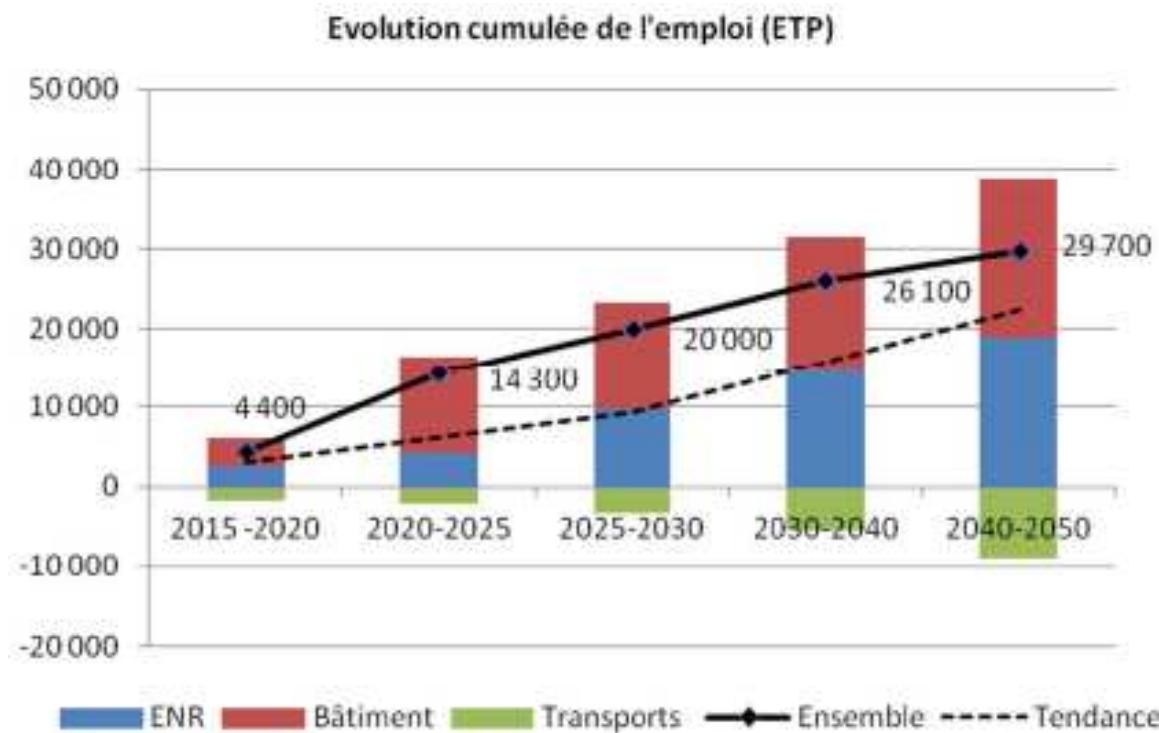
- *Increasing industries :*
  - ➔ Housing renovation: +12 100 FTJ
  - ➔ Tertiary renovation: +10 900 FTJ
  - ➔ Heat network: +1 300 FTJ
  - ➔ Total : + 24 300 FTJ
- *Decreasing industries :*
  - ➔ Installation and maintenance of gaz boiler: - 3 700 FTJ
  - ➔ Gaz distribution : - 900 FTJ
- *Total : +19 700 FTJ*
  - ➔ Directs jobs : 13 400
- *Current trend (directs jobs) : + 2 500*



# Global preliminary results



- Increase of jobs in impacted industries : 29 700 FTJ (slight increase compare to BAU scenario +7 000 FTJ)

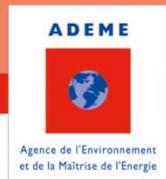


- NB : The 150 000 current FTJ concerned must be compared to the 2,18M of regional jobs (7%)

# First teachings and questions



- If we want to implement energy transition, we have to work on decentralized / local scale for :
  - ➔ Identification of potentials - RE, fatal heat, energy savings...
  - ➔ Job and skills issues
- Scale and definition of « autonomy » is always a question
- Issue on financial resources : need of the national procedures - CSPE for wind- and some national call for tenders not adapted -CRE for solar-
- Solidarity with less potentials or not pioneers territories will be an issue



Thanks for your attention

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