



COMMISSION  
DE RÉGULATION  
DE L'ÉNERGIE

**DFBEW / OFATE**

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## Energy system integration – the perspective of the energy regulator

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Affairs and Cooperation

# OUTLINE

How can sector integration contribute to attaining the national and European climate and environmental objectives?

1. What are these objectives?
2. What is sector integration?
3. The perspective of the French energy regulator

# OBJECTIVES

## European Union

- 2030
  - Reduction of greenhouse gas (GHG) emissions: - 40 % (proposal to move to: - 55 %)
  - Renewable energy: 32 %
  - Energy consumption: - 32,5 %

- 2050
  - Climate neutrality

## Germany

- 2030
  - Reduction of GHG emissions: - 55 %
  - Renewable energy: 30 % (gross electricity consumption: 65 %)

- 2050
  - Primary energy consumption: - 50 %
  - Climate neutrality

## France

- 2028
  - Reduction of GHG emissions (energy combustion): - 40 %
  - Final energy consumption: - 16,5 %
  - Renewable energy: 33 %

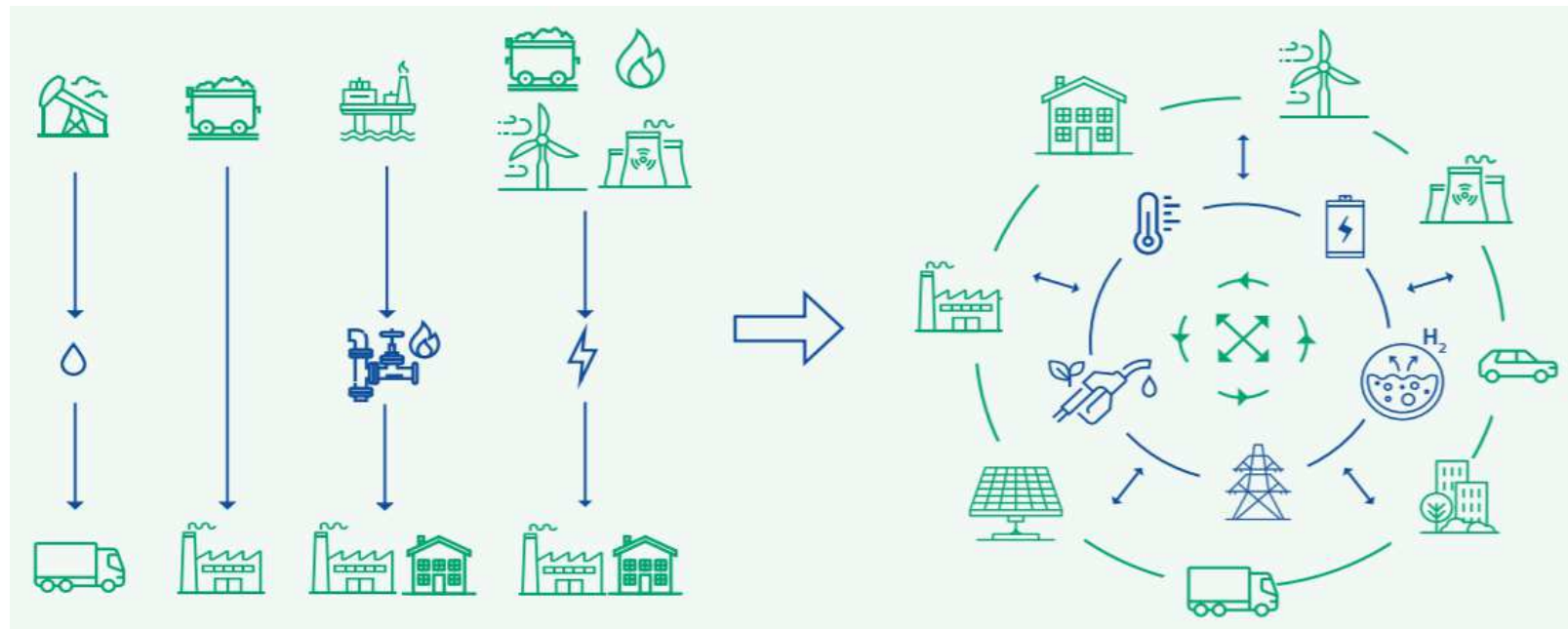
- 2050
  - Climate neutrality

# SECTOR INTEGRATION

- Observations
  - Electricity from renewable energy sources is difficult to store.
  - Other consumption sectors are still big GHG emitters (transport, industry).
- Objective: linking the different energy production and end-use sectors
  - Better integration of renewable electricity
  - Decarbonising sectors that are high-carbon
  - Savings thanks to synergies
- Expected benefits
  - Reductions of GHG emissions, energy consumption and pollution
  - Economic growth and local employment
  - Energy system resilience

# THE EUROPEAN COMMISSION'S STRATEGY

- [08.07.2020 : EU Strategy for Energy System Integration](#)
- Objective: moving from a linear and segmented energy system to a integrated and multidirectional system



Source : European Commission

<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2020:299:FIN>

# THE STRATEGY'S THREE PILLARS

## 1. *A more efficient and circular energy system*

- Energy efficiency first
- Better comparability of energy carriers
- Reuse of waste heat, waste and residues

## 2. *Greater electrification of end-use sectors, and a system powered by renewable energy sources*

- Offshore renewable energy > [19.11.2020 : Offshore Strategy](#)
- Electromobility
- Storage and flexibility

## 3. *Renewable and low-carbon fuels for hard-to-decarbonise sectors*

- Renewable fuels
- Hydrogen > [08.07.2020 : Hydrogen Strategy](#)
- Carbon capture, storage and use (CCS, CCU)

# SECTOR INTEGRATION – ISSUES AND CHALLENGES

- Electricity system management: flexibility, storage, electric vehicles
- Infrastructure: integrated planning, alternatives, reuse of existing infrastructure
- The price of CO<sub>2</sub>
- Governance and taxation
- Hydrogen: viability, injection into the natural gas grid, dedicated hydrogen networks
- The geographic and social dimension

# THE ROLE OF THE REGULATOR



- Regulation of network operators
  - Approval of annual investment programmes
  - Setting tariffs for the use of electricity and natural gas networks
- Implementation of support schemes for renewable energy (auctions)
- The regulator has to think ahead.
- Working papers
  - **Nov. 2018: electricity networks and electric vehicles**
    - The French electricity grid should be able to accommodate a large number of electric vehicles, provided that the right measures are taken in advance.
  - **Sept. 2019 : electricity storage**



# CRE'S FORESIGHT COMMITTEE



ÉCLAIRER L'AVENIR

<https://www.eclairerlavenir.fr/>

## Season 1 Working Groups

- No. 1 : The impact of clean mobility on the energy mix
  - Road freight transport could switch to gas, maritime freight transport to LNG;
  - Road passenger transport will primarily rely on electric vehicles, plus gas and biofuels.
- No. 2 : Flexibility and storage in energy grids by 2030

## Season 2

- No. 1 : The greening of gas
  - Costs for biomethane production likely to fall, but the remaining price gap with natural gas will require the integration of externalities (CO<sub>2</sub>, additional income for agriculture).

## Season 3: in process

- No. 1 : Marine energies
- N° 2 : New cities and new networks
- N° 3 : Behind-the-meter
- N° 4 : Hydrogen

## WORK AT EUROPEAN LEVEL



European Union Agency for the Cooperation  
of Energy Regulators

The logo for CEER (Council of European Energy Regulators) features the acronym 'CEER' in a bold, blue, sans-serif font. To the right of the text is a stylized graphic consisting of four blue, curved lines that intersect at a central point, forming a star-like shape. A small yellow circle is positioned at the top intersection point.

CEER

Council of European  
Energy Regulators

- Nov. 2019 : « The Bridge Beyond 2025 »
  - Technology-neutral approach to conversion and storage facilities
  - Level playing field between new infrastructure and alternative solutions
  - “Re-use of existing [gas] assets should be explored prior to any decommissioning”

<https://www.ceer.eu/documents/104400/-/-/f1846269-a27b-b3db-5edc-697b9156d3c4>
- June 2020: Common position on the revision of the TEN-E Regulation
  - Joint scenarios for gas and electricity network development planning

<https://www.ceer.eu/documents/104400/-/-/c4f763dd-27e7-7113-9809-1ec50f530576>
- *White papers* in preparation on sector coupling
  - Long-term storage, hydrogen networks, regulation of power-to-gas

# IN CONCLUSION

- Integrated planning of electricity and gas infrastructure
- A rational use of infrastructure, including consideration of alternatives and the (re-)use of existing infrastructure
- Ensuring the comparability and a level playing field between the different technologies and energy carriers
- Integrating externalities linked to CO<sub>2</sub> emissions
- Avoiding double burdens for integrated solutions from regulation and taxation

**THANK YOU FOR YOUR ATTENTION.**

**MERCI DE VOTRE ATTENTION.**

**DANKE FÜR IHRE AUFMERKSAMKEIT.**

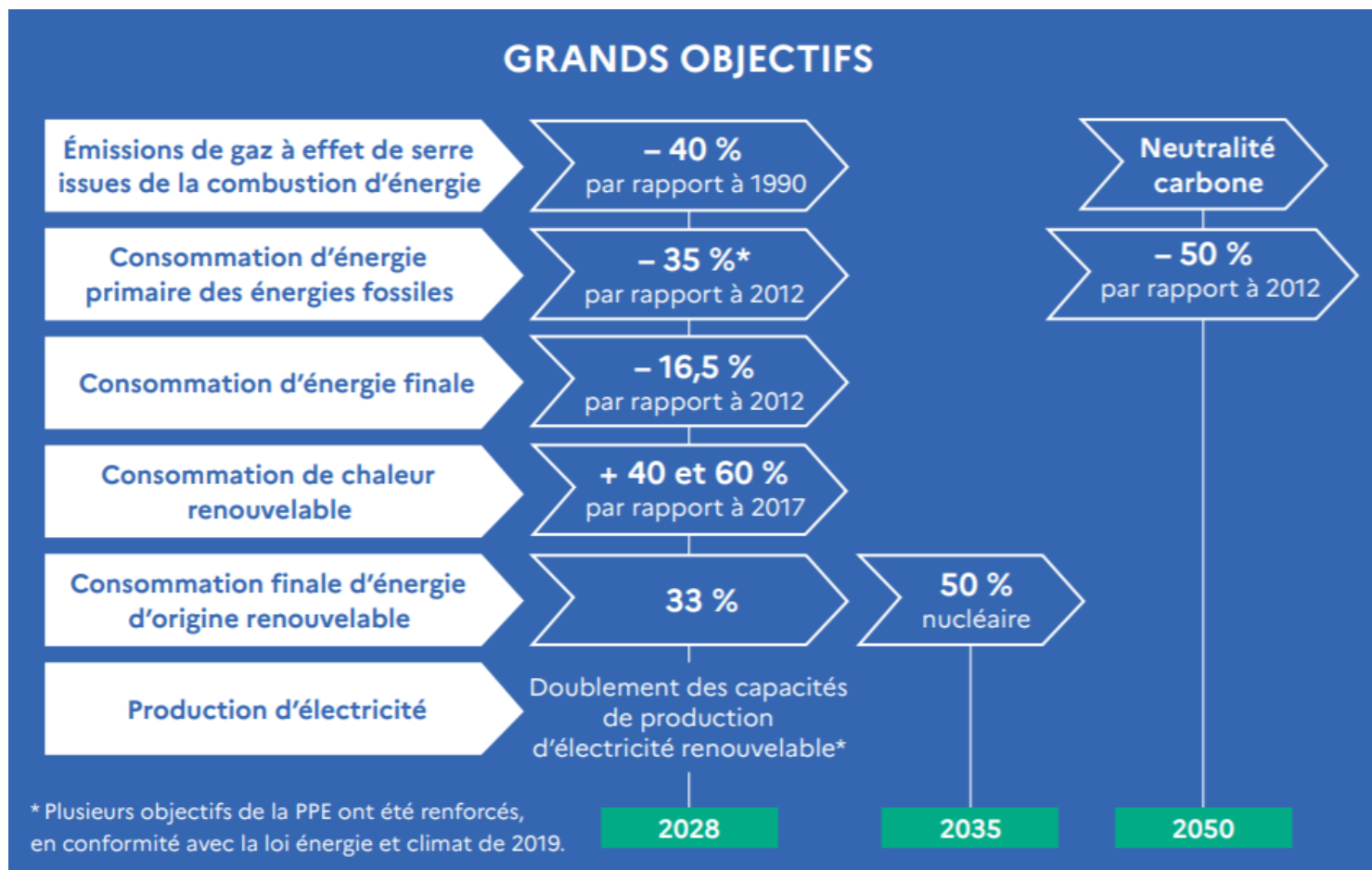


# ANNEXES



# FRANCE – NATIONAL OBJECTIVES

- Programmation pluriannuelle de l'énergie et stratégie bas-carbone



<https://www.ecologie.gouv.fr/programmations-pluriannuelles-lenergie-ppe>

Source : MTE

# CRE WORKING PAPERS

Nov. 2018 : electricity grids and electric vehicles



<https://www.cre.fr/Documents/Publications/Rapports-thematiques/Vehicules-electriques>



Sept. 2019 : electricity storage



<https://www.cre.fr/Documents/Publications/Rapports-thematiques/Le-stockage-d-electricite-en-France>

# CRE POSITION PAPERS



## March 2020 : CRE position papers on the European Green Deal

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| 1 : Governance and subsidiarity      | 6 : Green gas                     |
| 2 : Mirroring of gaz and electricity | 7 : Sector coupling               |
| 3 : Infrastructure                   | 8 : The role of network operators |
| 4 : Gas market design                | 9 : The use of interconnections   |
| 5 : Gas storage                      | 10 : REMIT                        |

FR :

<https://www.cre.fr/media/Fichiers/autres/pacte-vert-europeen-la-contribution-de-la-cre-pour-construire-le-monde-energetique-de-demain>

EN : <https://www.cre.fr/en/media/File/autres/fiche-europe-1>



# CRE FORESIGHT COMMITTEE – SEASON 1



 Comité  
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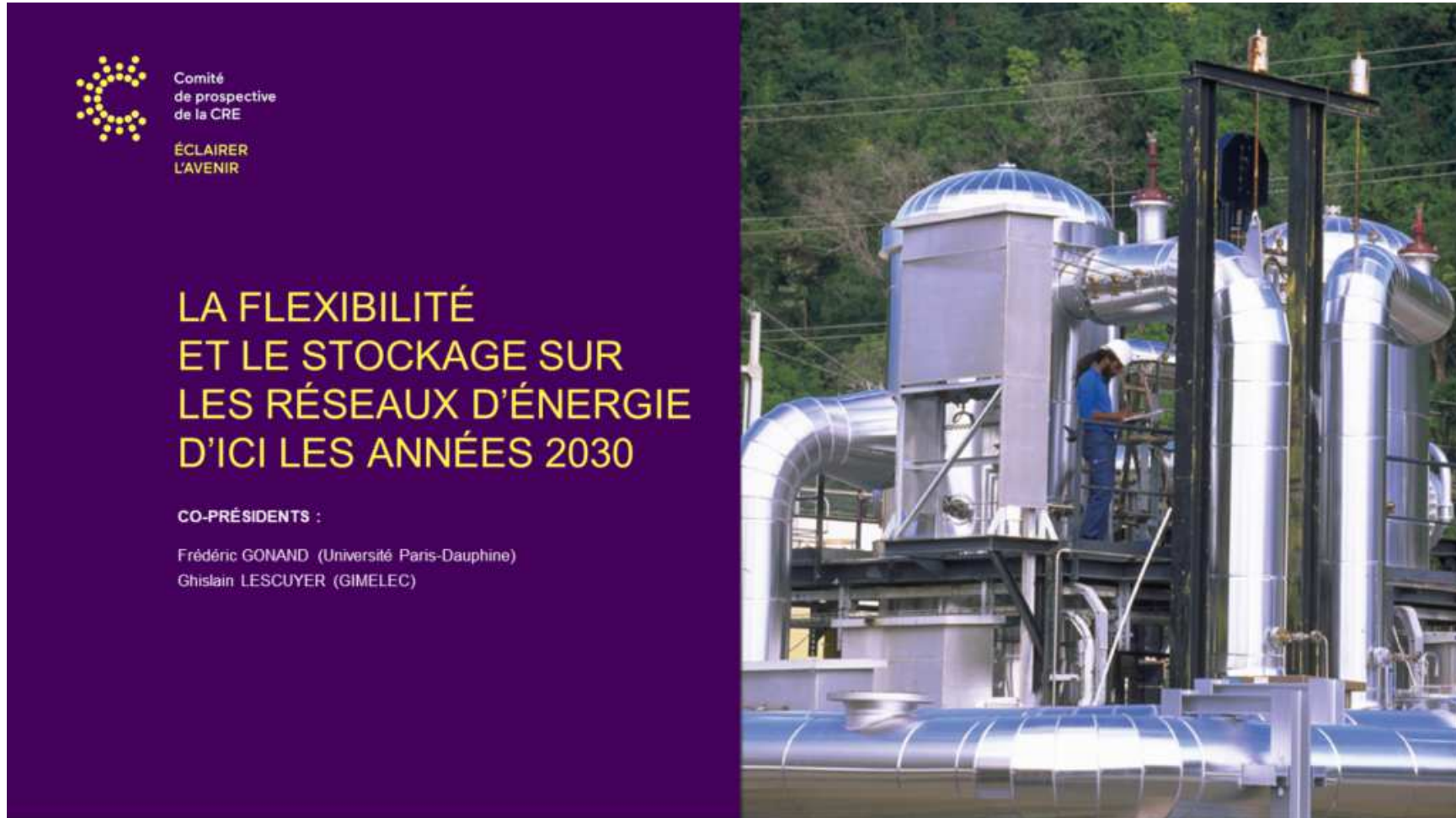
## IMPACT DE LA MOBILITÉ PROPRE SUR LE MIX ÉNERGÉTIQUE


CO-PRÉSIDENTS :

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Olivier PEROT (Président de France Energie Eolienne)

<https://www.eclairerlavenir.fr/rapports/rapport-2018-gt1/>

# CRE FORESIGHT COMMITTEE – SEASON 1



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## LA FLEXIBILITÉ ET LE STOCKAGE SUR LES RÉSEAUX D'ÉNERGIE D'ICI LES ANNÉES 2030

CO-PRÉSIDENTS :

Frédéric GONAND (Université Paris-Dauphine)  
Ghislain LESCUYER (GIMELEC)

<https://www.eclairerlavenir.fr/rapports/rapport-2018-gt2/>

# CRE FORESIGHT COMMITTEE – SEASON 2



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## LE VERDISSEMENT DU GAZ

### CO-PRESIDENTS :

OLIVIER APPERT, Membre de l'Académie des technologies  
PHILIPPE MAUGUIN, Président-Directeur général de l'INRA

### RAPPORTEUR :

THIBAUT FELIX, Auditeur au Conseil d'Etat



<https://www.eclairerlavenir.fr/rapports/rapport-2019-gt1/>