

# I4CE

INSTITUTE FOR  
CLIMATE  
ECONOMICS

Une initiative de la Caisse des Dépôts et  
de l'Agence Française de Développement

# From the French national low-carbon strategy to investment needs

## Workshop on financial flows and investment need

14/03/2019

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### With the support of



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Agence de l'Environnement  
et de la Maîtrise de l'Énergie









# Track climate investments and analyse how they are funded

The government is to present an annual report to the Parliament which quantifies and analyses public finance, assesses private finance, and measures their adequacy with the financial requirements to achieve the objective and transition pace of the law.

Article 174 of the Energy transition for green growth act (adopted 2015)

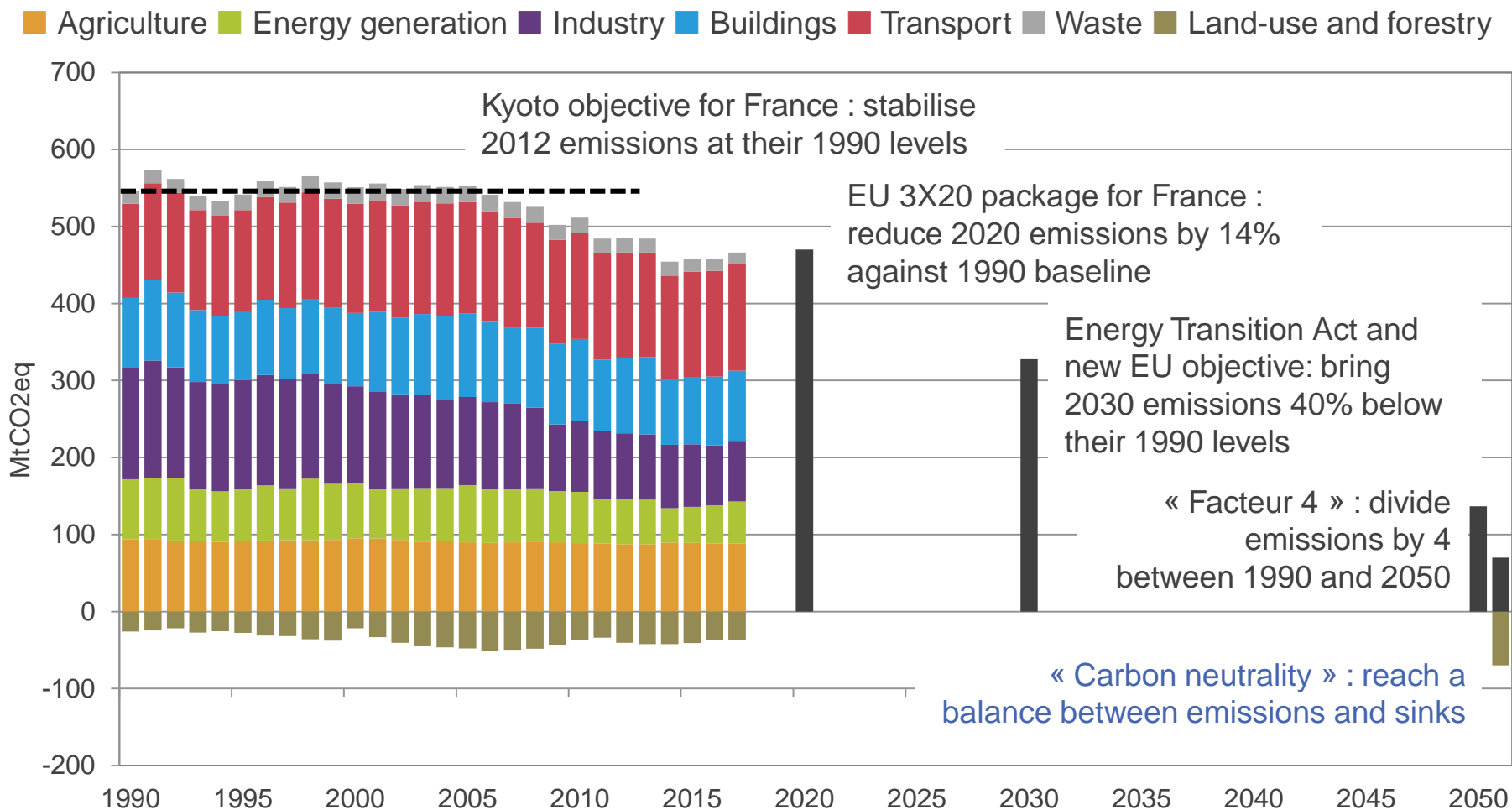
# France's climate strategic documents, adopted in 2015, are currently under revision

In 2015, France's Energy transition act established two strategic plans

|                                                | National low-carbon strategy<br>Stratégie nationale bas-carbone (SNBC)                                                                                                                                                                                                             | Multiannual energy plan<br>Programmation pluriannuelle<br><i>de l'énergie (PPE)</i>                                                                                                                                                                                                                             |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First version adopted in 2015-2016             | <p> 2030</p> <p> « <b>facteur 4</b> » -75% GHG emissions against 1990 levels<br/>Carbon budgets</p>              | <p> 2023</p> <p> +50% renewable energy generation &amp; capacity<br/>-12% final energy<br/>-22% fossil fuels</p>                          |
| Second version revision in 2018-2019 (project) | <p> 2050</p> <p> <b>climate neutrality</b> with -85% GHG emission against 1990 levels<br/>Carbon budgets</p> | <p> 2028</p> <p> +100% electric renewable capacity and +60% renewable heat generation<br/>-14% final energy<br/>-35% fossil fuels</p> |

# France climate neutrality by 2050 goal means zero emissions from fossil fuel

Evolution of GHG emissions in France from 1990 to 2017 and national climate objectives (based on CITEPA inventory)



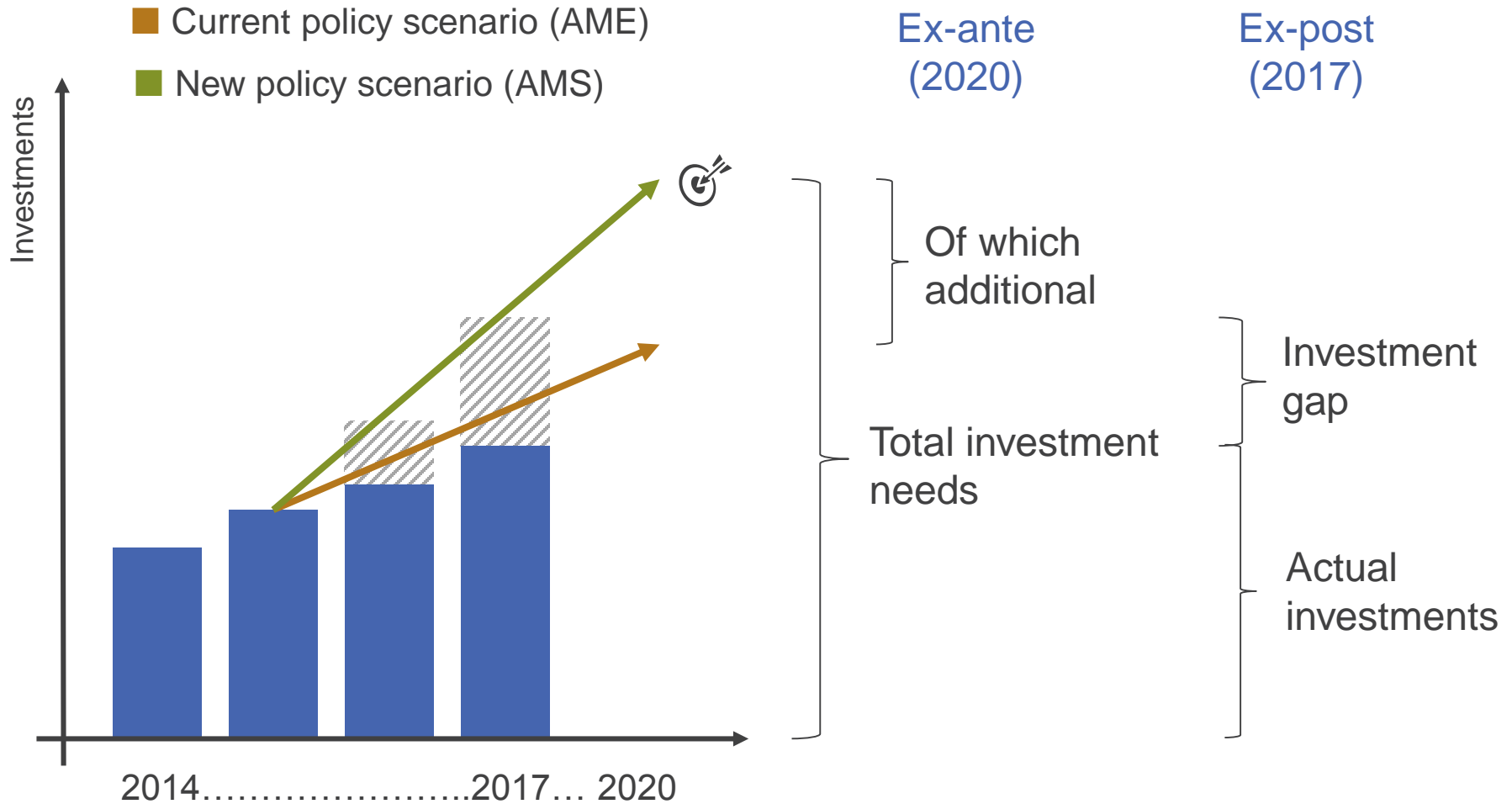
# Translate climate objectives into investment needs and a corresponding "business plan"

“ The national low-carbon strategy and the multiannual energy plan are not currently based on an estimate of investment needs by sector, nor on their distribution between public and private financing.

However, it is essential to provide industrial actors with the milestones of a "business plan" for the transition, quantifying needs by sector and giving visibility on public and private commitments ”

Parliamentary mission on private investment in the Energy transition

# Total investment needs, and investment gap in low-climate projects



# We used volume and cost data from both national strategies and third-party sources

(in 2020)

■ SNBC & PPE ■ Third-party source ■ I4CE

|                  |                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Buildings        | 380,000 dwellings retrofitted × 17-23k€ per dwelling<br>= 18 to 21 billion euros                                                                       |
| Vehicles         | 120,000 electric cars sold × 18-25k€ per vehicle<br>= 2,2 to 3 billion euros                                                                           |
| Wind power       | 1360 to 2200 MW installed × 1300€ per kW<br>= 1,8 to 2,8 billion euros                                                                                 |
| Railways         | SNBC calls for the implementation of the 10-year contract between the State and SNCF Réseau<br>= 4,8 billion euros per year                            |
| District heating | Local government association AMORCE estimates<br>400,000 homes need to be connected annually<br>× 5-10k€ per home-equivalent<br>= 2 to 4 billion euros |

# Reminder : knowledge of investments and finance varies across sectors

|                                    | Housing | Transport | Energy production | Tertiary | Agriculture | Industry | R&D | Adaptation |
|------------------------------------|---------|-----------|-------------------|----------|-------------|----------|-----|------------|
| Climate investment 2011-2017       | ✓       | ✓         | ✓                 | partial  | partial     | partial  | ×   | ×          |
| Climate investment needs 2016-2030 | ✓       | partial   | ✓                 | ✓        | ×           | ×        | ×   | ×          |
| Investment in fossil fuels         | ✓       | ✓         | ✓                 | partial  | ×           | ×        | ×   | ×          |



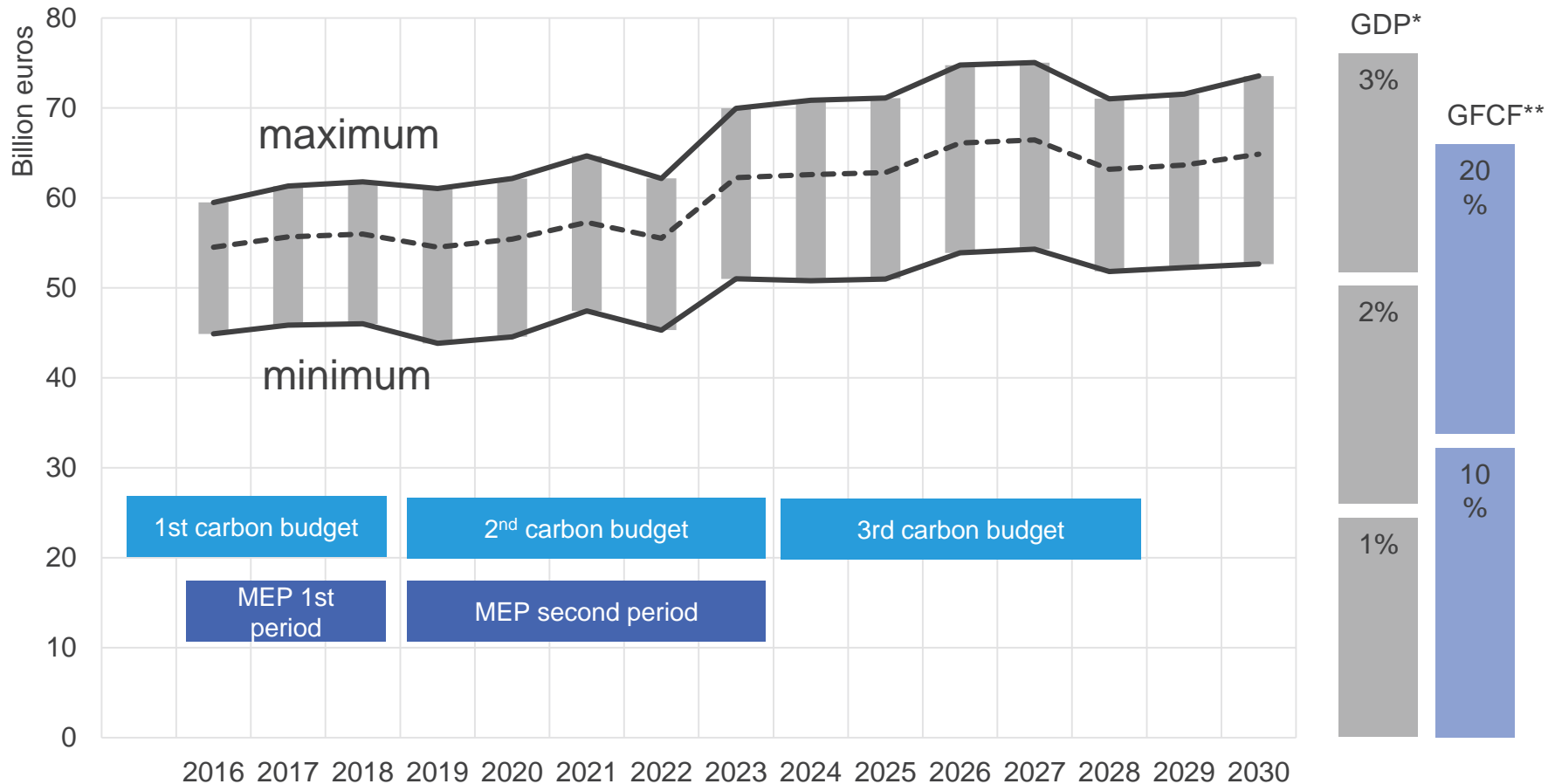
## OVERVIEW OF CLIMATE INVESTMENT ACTIONS COVERED IN GAP ANALYSIS

| Current and past climate investment covered in the Landscape of climate finance, 2017 Edition |                                                                                                            |                                                                                                                             |                                                                            |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Sector                                                                                        | Investments needs documented from SNBC and PPE                                                             |                                                                                                                             |                                                                            |
|                                                                                               | Excluded from gap analysis                                                                                 | Included in gap analysis                                                                                                    | Excluded from gap analysis                                                 |
| <b>Buildings</b>                                                                              | Biomass in multi-unit housing and tertiary buildings                                                       | Energy efficiency in new buildings (housing & tertiary)<br>Energy retrofiting of existing buildings (housing & tertiary)    | Complete construction cost of new buildings (outside of energy efficiency) |
| <b>Transport</b>                                                                              | Electric light-goods vehicles<br>Electric and hybrid heavy-duty vehicles<br>Electric, hybrid and NGV buses | Electric and hybrid cars<br>NGV heavy-duty vehicles<br>Railways (infrastructure)<br>Urban public transport (infrastructure) | -                                                                          |
| <b>Industry</b>                                                                               | Energy efficiency*                                                                                         |                                                                                                                             | Energy efficiency*                                                         |
| <b>Agriculture</b>                                                                            | Energy efficiency<br>Forestry                                                                              | Power generation from biogas (anaerobic digestion)                                                                          | -                                                                          |
| <b>Centralized energy production and networks</b>                                             | Nuclear (EPR and retrofiting of current plants)<br>Geothermal electricity<br>Biomethane injection          | Renewable power generation (onshore wind, solar PV, biomass, biogas, small hydro).<br>Extension of heating networks         | -                                                                          |

\* In the industrial sector, even though both current and required climate investment can be estimated, scope and sources differ too widely to allow a direct comparison

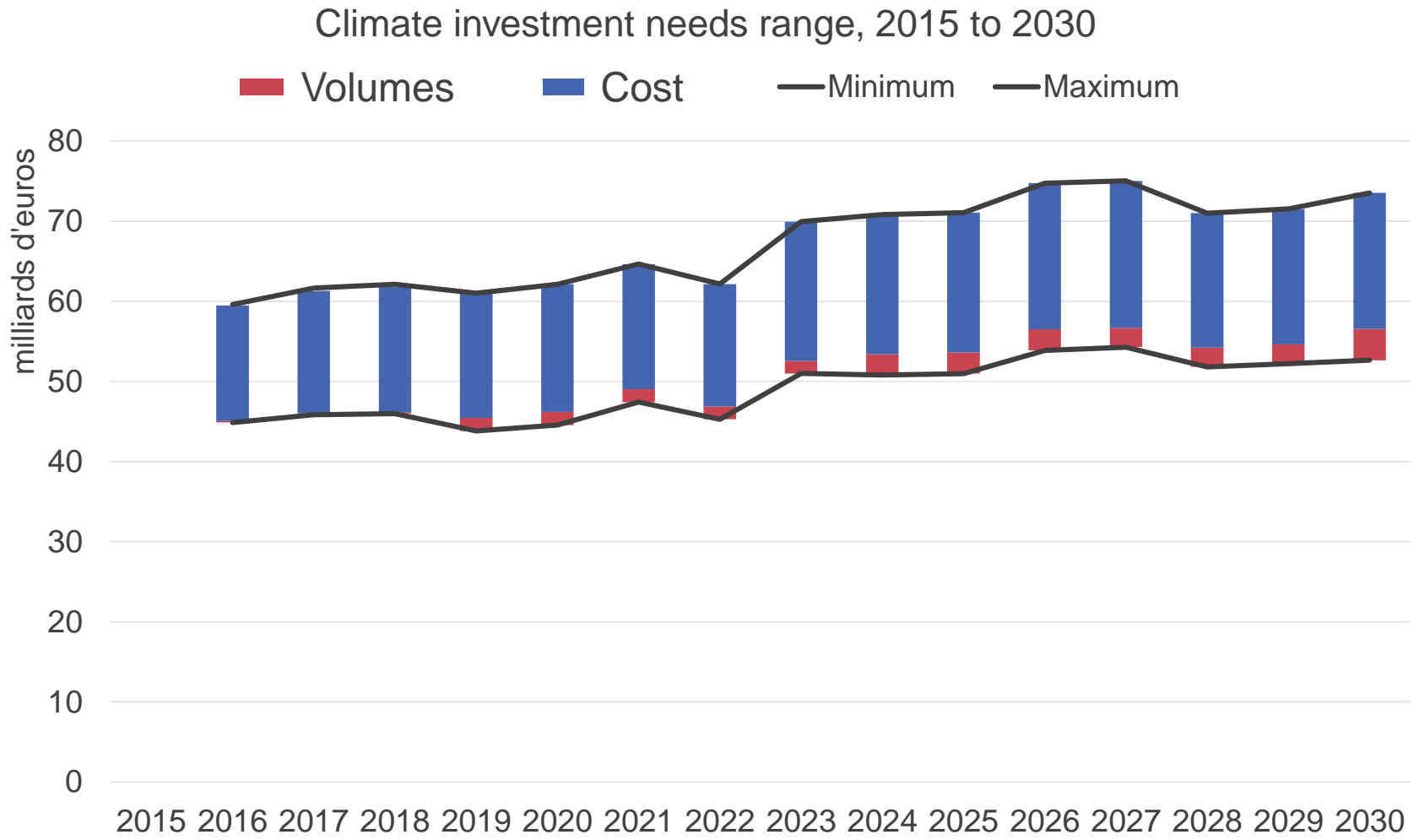
# Between 45 and 75 billion euros per year needed to achieve climate objectives

Estimation des investissements annuels en 2016 et 2030 d'après la SNBC et la PPE  
 (périmètre commun au Panorama des financements climat)

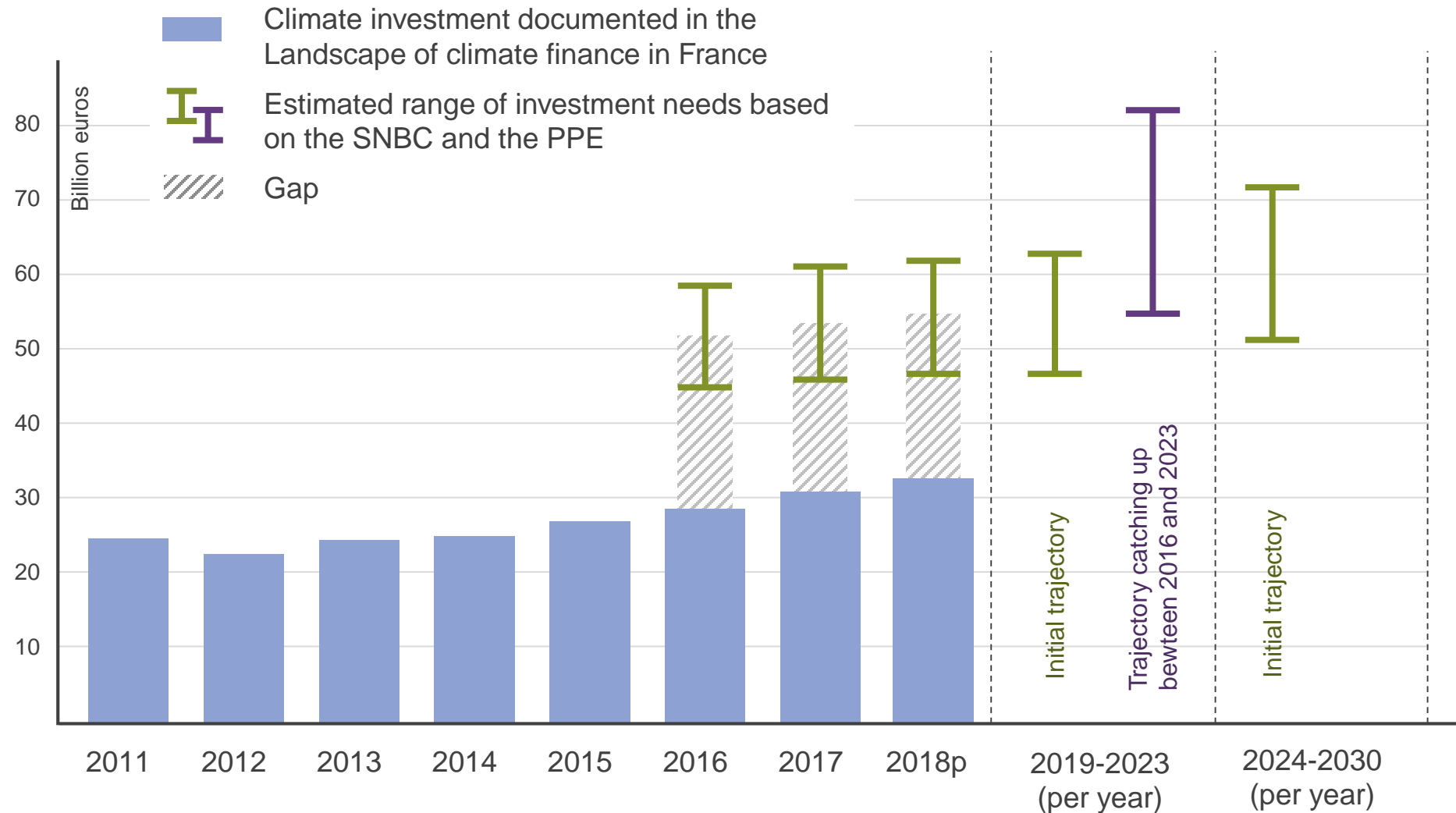


\* In 2016, France's GDP was 2465 billion euros; \*\* In 2016, gross fixed capital formation was 371 billion euros

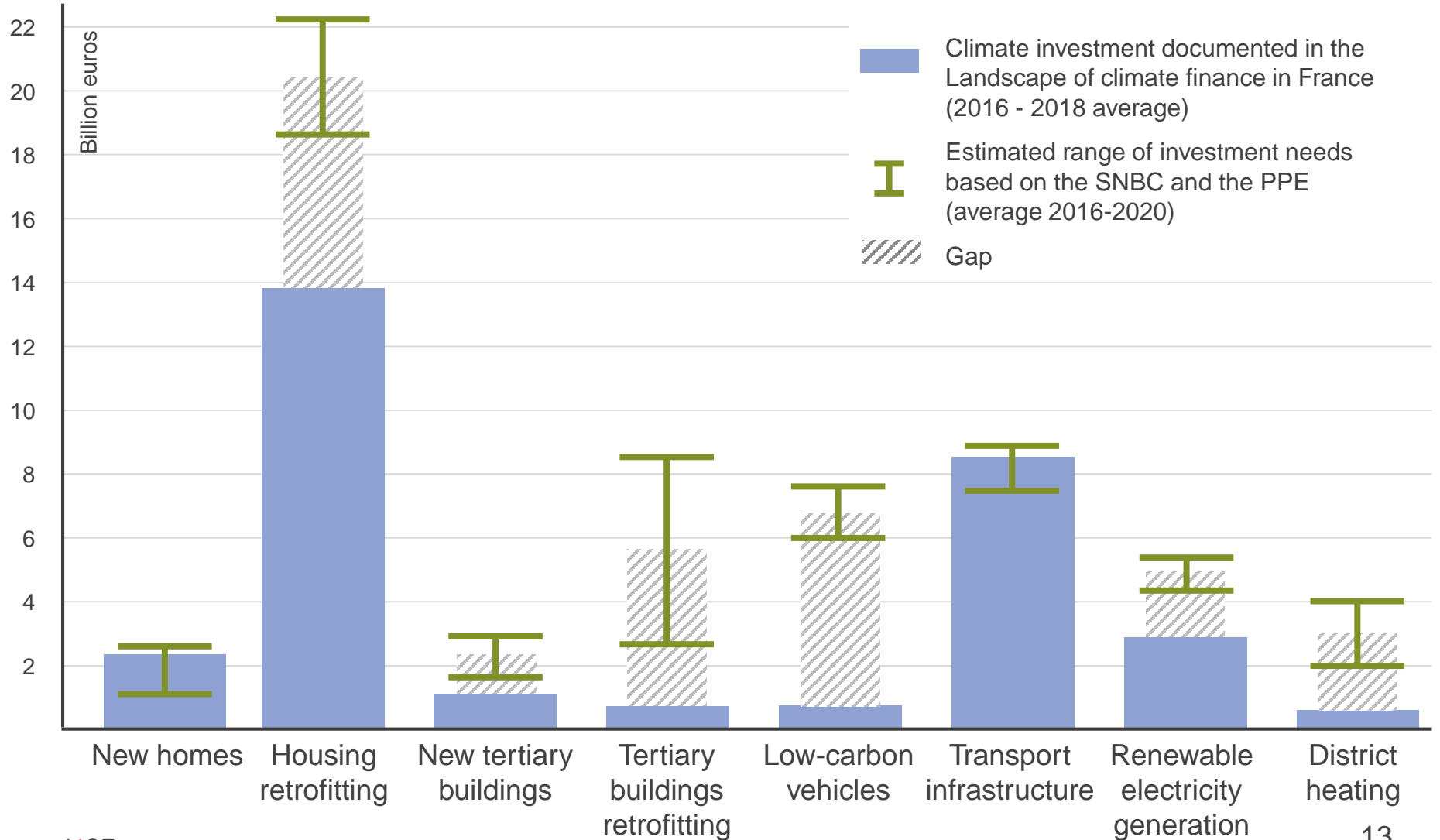
# Most of the range (uncertainty) in investment needs is related to costs













**A gap of 10 to 30 billion euros per year compared to estimated needs to achieve national climate goals**



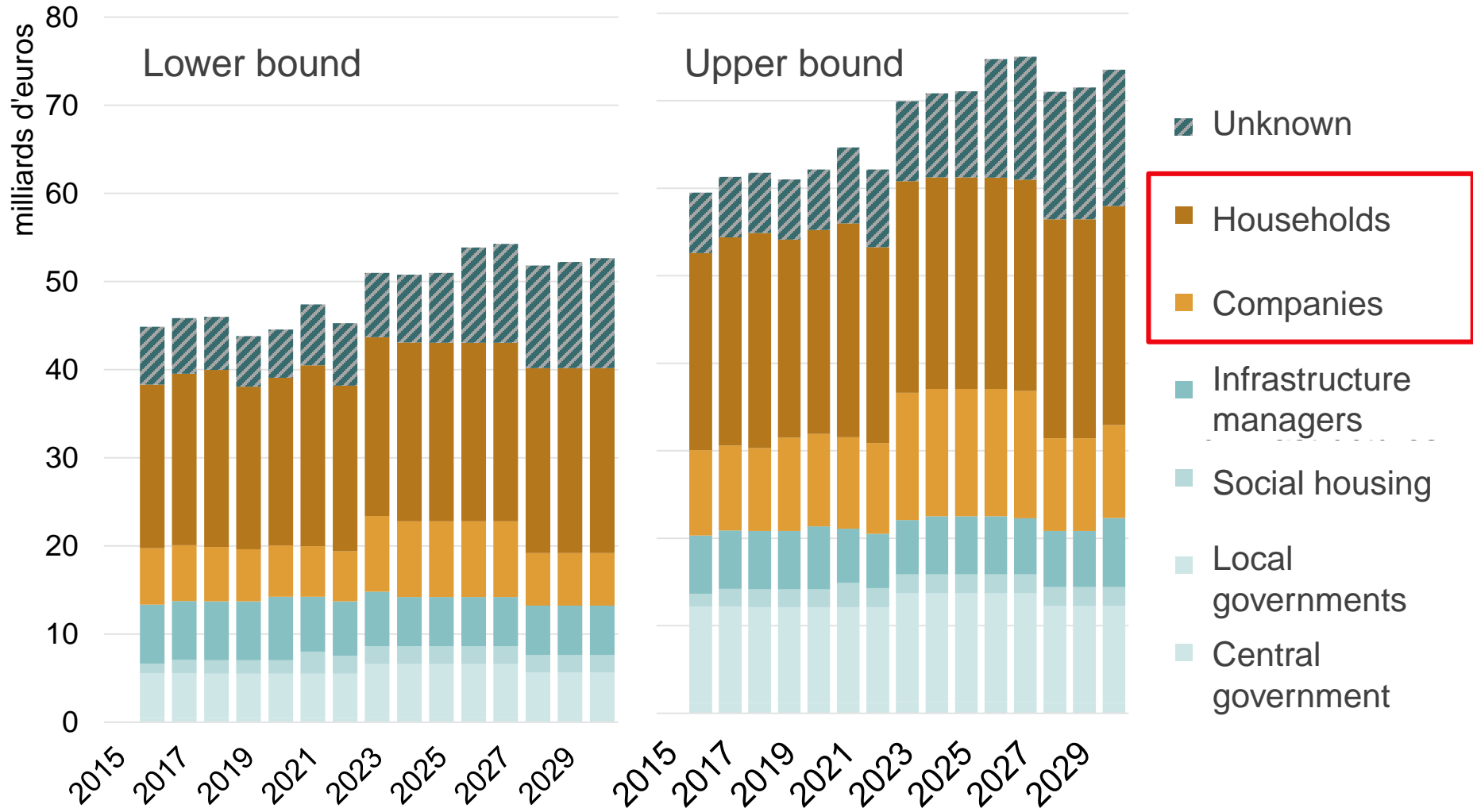
# Investment gaps vary across sectors



# Investment gaps vary across sectors

|                                     | Renewable electricity                                                                                | Low carbon vehicles                                                                                  | Transport infrastructure                                                                               | Housing retrofitting                                                                                   | District heating                                                                                       |
|-------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Climate investment in 2017          | 4 <br>billion €     | 1.4 <br>billion €   | 9.6 <br>billion €   | 14.3 <br>billion €  | 0.3 <br>billion €   |
| Gap with 2016-2020 investment needs | +1 - 2<br>billion €                                                                                  | +5 - 6<br>billion €                                                                                  | +0.3<br>billion €                                                                                      | +5 - 8<br>billion €                                                                                    | +2 - 4<br>billion €                                                                                    |
| Publicly-driven finance in 2017     | 1.8 <br>billion € | 0.4 <br>billion € | 9.5 <br>billion € | 4.2 <br>billion € | 0.3 <br>billion € |

# Investment needs rely principally on private project developers



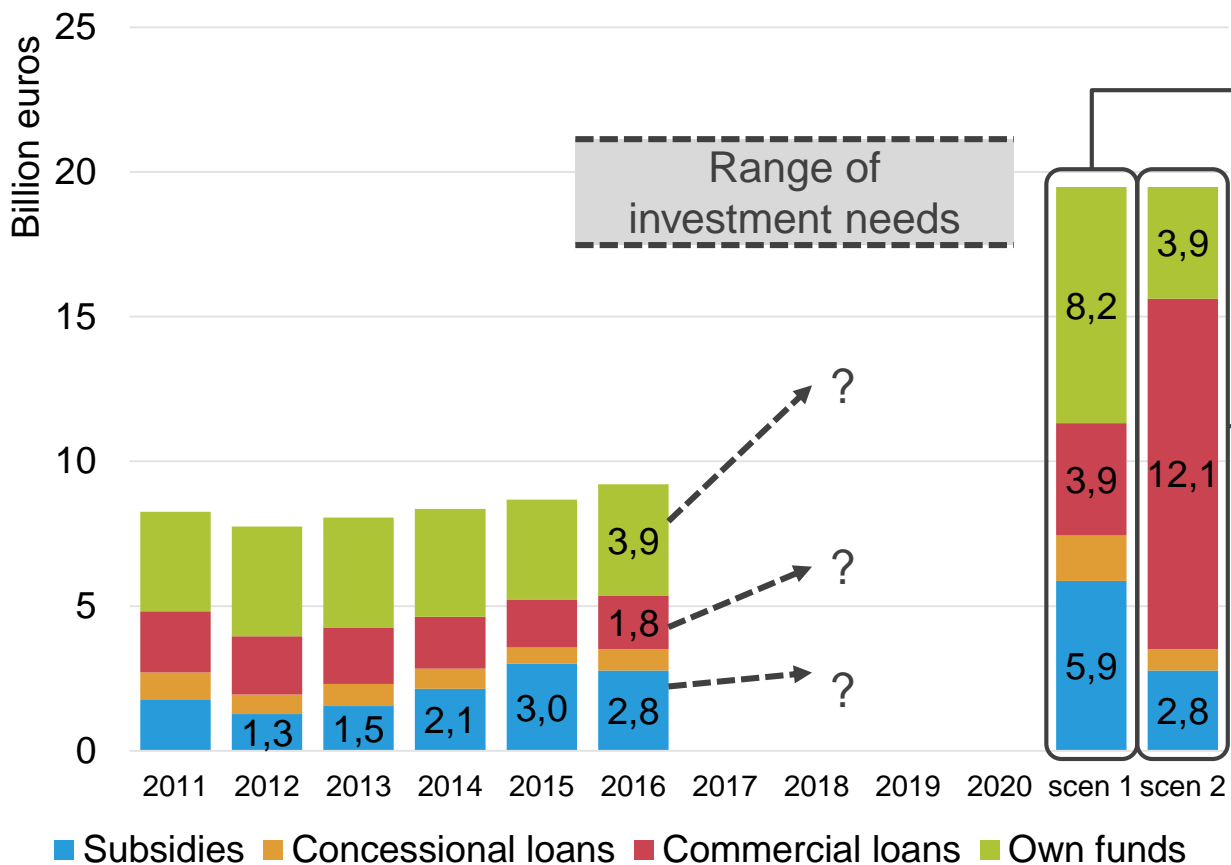
# Next steps and challenges ahead

- Update estimates of investment needs
  - Relative to the revised SNBC & PPE (2019)
- Improve scope, quality of estimates
  - Scope : agriculture, industry, nuclear, vehicle charging infrastructure, behaviour ...
  - Quality : narrow cost uncertainties, working closely with operators of state, agency and academic models
- Propose forward-looking “business plans”
  - Attribution to project developers (public, private)
  - Explore possible alternative funding sources



# An illustrative funding plan for the private residential sector

Current climate investment and climate investment needs in private dwellings in France



**Scenario 1**

- Constant leverage
- No significant change in project profitability or cost
- Investment objectives achieved through increase public funding with matching private cofunding

**Scenario 2**

- Increased leverage
- Constant public funds
- Increase in project profitability and reduced costs and risks
- Involvement of third party private finance (e.g. loans)

Thank you for your attention!

Questions and comments  
welcome at

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