I4CE
INSTITUTE FOR CLIMATE ECONOMICS
Une initiative de la Caisse des Dépôts et de l'Agence Française de Développement

Landscape of climate finance in France

Edition 2018

Hadrien **Hainaut** | Lola **Gouiffes** | Ian **Cochran** | Maxime **Ledez**

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE

ADEME
Agence de l'Environnement et de la Maîtrise de l'Energie

I4CE – Institute for Climate Economics is a think tank that provides public and private decision-makers with expertise on economic and financial issues related to the energy and ecological transition.

We strive to implement the Paris Agreement, and make global financial flows compatible with low-carbon development that is resilient to climate change.

I4CE is an initiative of Caisse des Dépôts and Agence Française de Développement and is also supported by Morocco's Caisse de Dépôts et Gestion.

Study overview

The Landscape of Climate Finance is a comprehensive study of domestic financial flows in favour of climate and the broader energy transition in France. The study maps the flows supporting investments leading to greenhouse gas mitigation across the French economy.

Findings are compared from year to year and assessed in comparison to projected investment needs to achieve national greenhouse-gases (GHG) reduction targets and other energy transition objectives. The Landscape of Climate Finance lists the climate investment expenditure in France and analyses the way in which these expenditures are financed.

In this way, the Landscape contributes to the public debate on the relevancy of public and private climate finance.

The Landscape is based on a transparent methodology, and its results are discussed in a steering committee composed of representatives from the Ministry of Ecological Transition and solidarity, the Ministry of Finance and the French Energy Management Agency (ADEME). Since 2016, I4CE is working with partners at the European level and internationally to support the development of similar analyses in different countries such as Colombia, Poland and Morocco.

Nota Bene: A word on the limits of the study

The Landscape of domestic climate finance aggregates publicly available information on low-carbon investments and their financing in France between 2011 and 2017. In addition, this report provides estimates of climate investment levels in 2018, based on available data from the first months of the year or on the budget forecasts of companies and public bodies.

In the agricultural and industrial sectors, lack of data limits the assessment of current investments and makes it impossible to present a complete snapshot of climate investment needs and the sum of investments with climate-adverse effects.

These results update those of previous editions of the Landscape and should not be compared to past estimates. Changes in sources, methodology and in the scope of the study has led to the revision of the results for the entire period 2011-2018. However, comparisons between years presented in this edition remain valid as they are based on a constant method and have been updated.

Suggested Reading

To learn more about the Landscape and climate change finance:

Low-carbon investments in France 2011-2017

This report is intended for those who want to understand in detail the climate investments in France, as well as the associated public policies. It provides detailed information on the Landscape methodology itself. It aims to support, if not inspire, all those who would like to develop similar exercises in their countries.

https://www.i4ce.org/download/low-carbon-investment-2011-2017/

The Landscape of domestic climate investment and finance flows: Methodological lessons from five years of application in France.

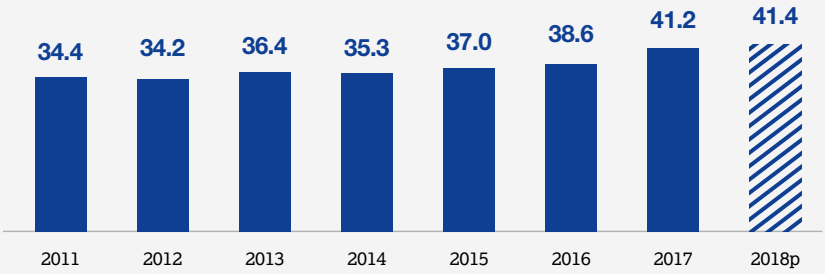
To further improve transparency on the assumptions and data used for its Landscape, I4CE detailed the methodology in an article published in the academic journal *International Economics*. This article is intended to facilitate the work of those who would like to reproduce such an exercise in other countries, and to validate the academic rigour of the Landscape.

https://www.i4ce.org/the-landscape-of-domestic-climate-investment-and-finance-flows-methodological-lessons-from-fiveyears-of-application-in-france/

Climate investments in France have been on the rise since 2014

Climate investments reached 41.2 billion euros in 2017. The increase of 17% over the last three years contrasts with the stability observed between 2011 and 2014. The available data for 2018 does not contradict the continuation of this trend.

CLIMATE INVESTMENT IN FRANCE 2011-2018p (in billion euros)



Climate Investments in 2017
41.2 billion euros

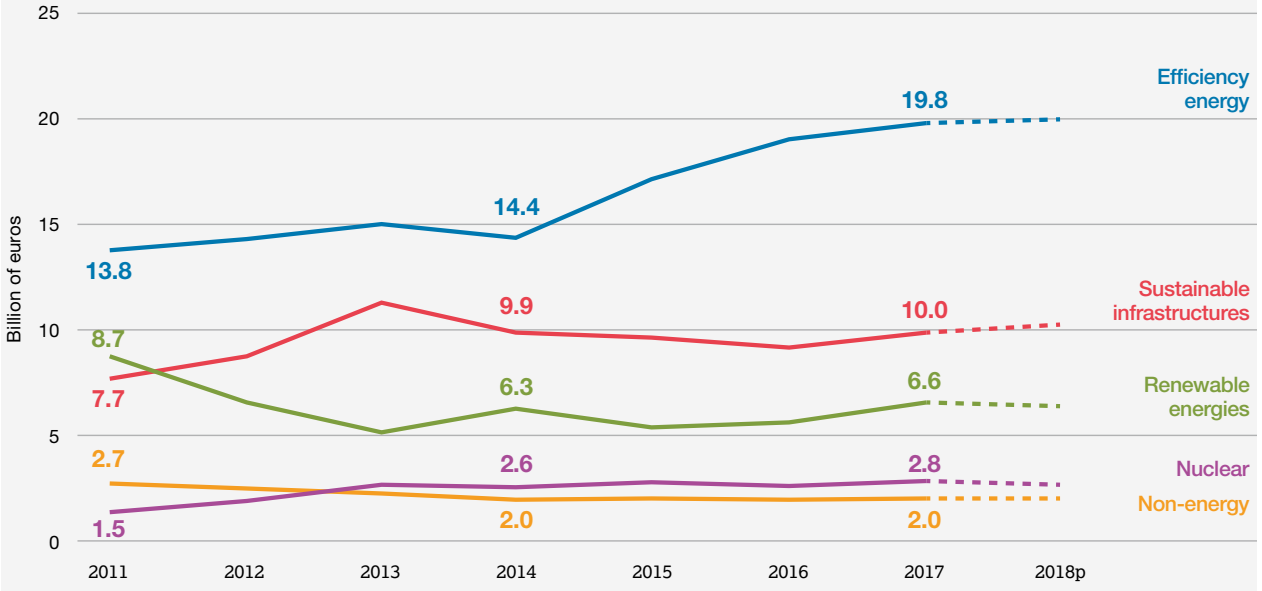
Gap with investment needs 2016-2020
10 to 30 billion euros per year

Publicly-driven finance in 2017
20 billion euros

Source: I4CE, Landscape of climate finance in France, Edition 2018

France spent nearly 20 billion euros on energy efficiency, 6.6 billion euros for the deployment of renewable energies, and 10 billion euros for sustainable transport and network infrastructure. Investments in development and extension of the nuclear fleet reached 2.8 billion euros. Those in the forestry and non-energy industrial processes represented 2 billion euros.
The increase observed since 2014 was concentrated in energy efficiency, while investments in other areas have been relatively stable.

INVESTMENTS IN FAVOR OF CLIMATE IN FRANCE, BY DOMAIN OF CONTRIBUTION TO THE LOW-CARBON TRANSITION



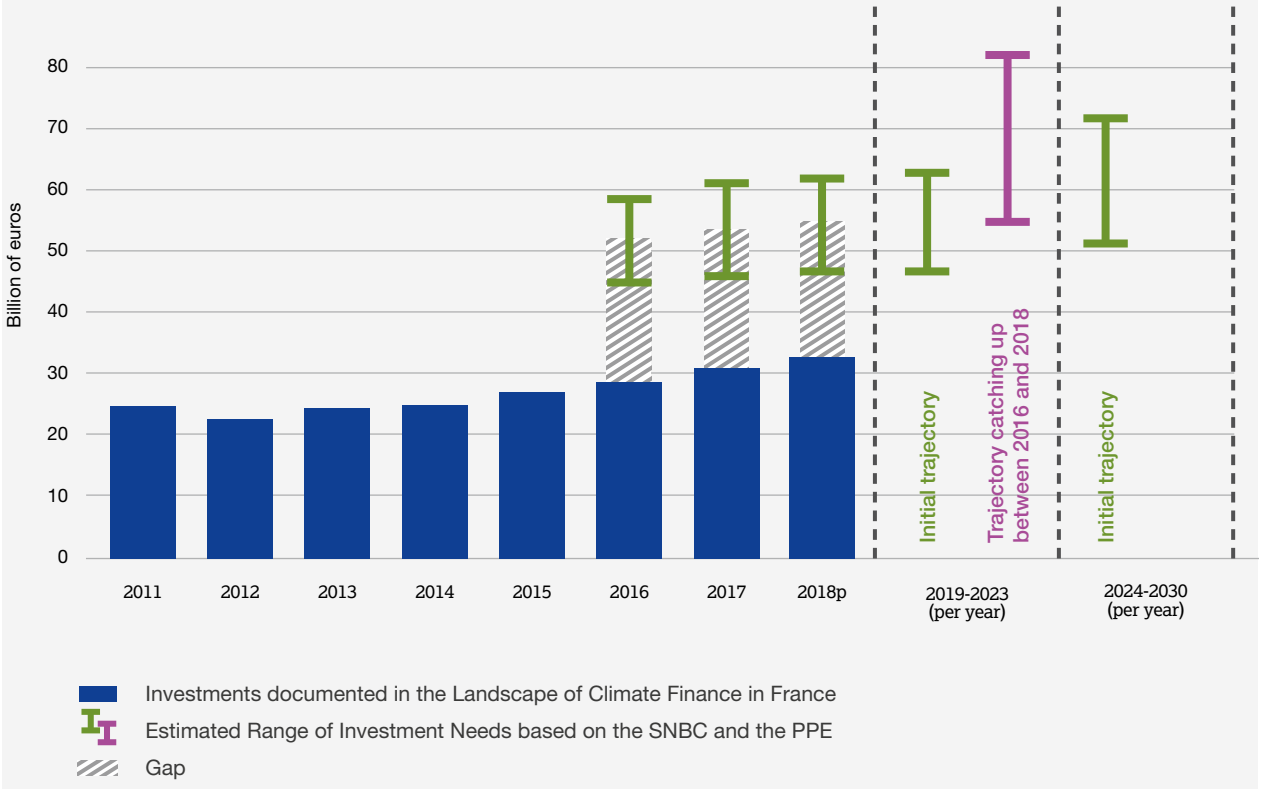
Source: I4CE, Landscape of climate finance in France, Edition 2018

A gap of 10 to 30 billion euros in annual investment compared to estimated needs to achieve national climate objectives

Nota Bene: annual investment amounts associated with national objectives are based on the targets of the 2015 National Low Carbon Strategy (SNBC) and the 2016 Multiannual Energy Plan (PPE). These two documents have been revised in 2018, however the new versions were not available prior to publication.

- The increase in investments observed since 2014 is reducing the annual gap relative to investment needs calculated based on the 2015 National Low Carbon Strategy and the 2016 Multiannual Energy Plan.
- However, the cumulated investment deficit between 2016 and 2018 already amounts to between 40 and 90 billion euros. To absorb the cumulated deficit between 2019 and 2023 and cover estimated investment needs would require an increase of total annual investments from between 45 to 65 billion euros to between 55 and 85 billion euros.

COMPARISON OF CLIMATE INVESTMENTS DOCUMENTED IN THE LANDSCAPE AND INVESTMENT NEEDS AFTER SNBC AND PPE

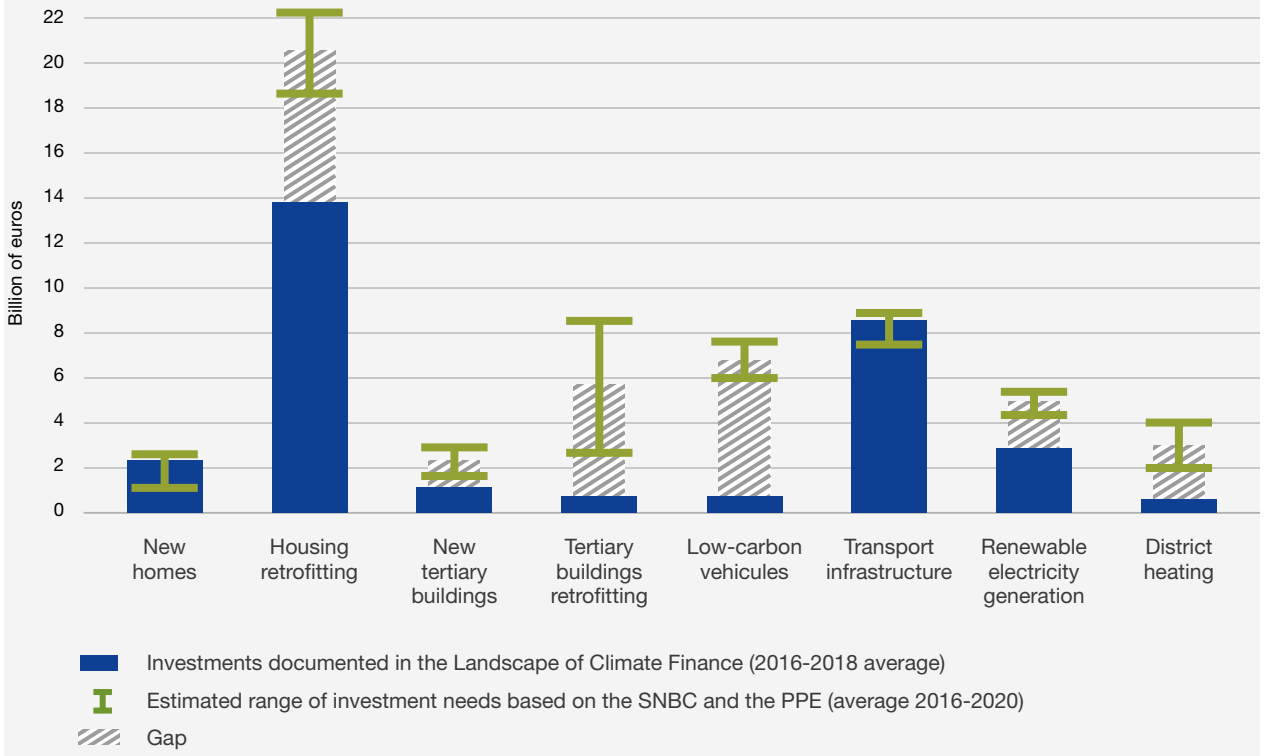


Source: I4CE, Landscape of climate finance in France, Edition 2018

Note: the total of tracked climate investments from 2011-2018 is less than the totals mentioned previously in this brief, as I4CE was unable to quantify future investment needs in sectors such as agriculture, industry and nuclear based on the SNBC and the PPE. Therefore, these sectors are excluded from the comparative assessment.

Significant investment gaps remain, particularly in the energy retrofitting of buildings, the deployment of low-carbon vehicles and in the extension of district heating.

DISTRIBUTION BY SECTOR OF GAPS BETWEEN INVESTMENTS IN THE LANDSCAPE AND INVESTMENT NEEDS IDENTIFIED IN SNBC AND PPE



Source: I4CE, Landscape of climate finance in France, Edition 2018

Note: for all sectors mentioned in this brief, the investment gap is defined as the difference between the average level of climate investments made between 2016 and 2018 and the average level of investment estimated as needed between 2016 and 2020.

I4CE estimated annual investment needs based on the quantified targets found in the SNBC and the PPE. For each sector, the value is calculated using an estimate of the needed material equipment (number of dwellings renovated, MW installed, km of infrustructure built) and one or more cost estimates either observed in recent years or anticipated in the SNBC and the PPE.

I4CE published the assumptions and sources for its calculation of investment needs according to the SNBC and PPE targets in a detailed note available here: www.i4ce.org/download/evaluation-investments-targets-climate-2017

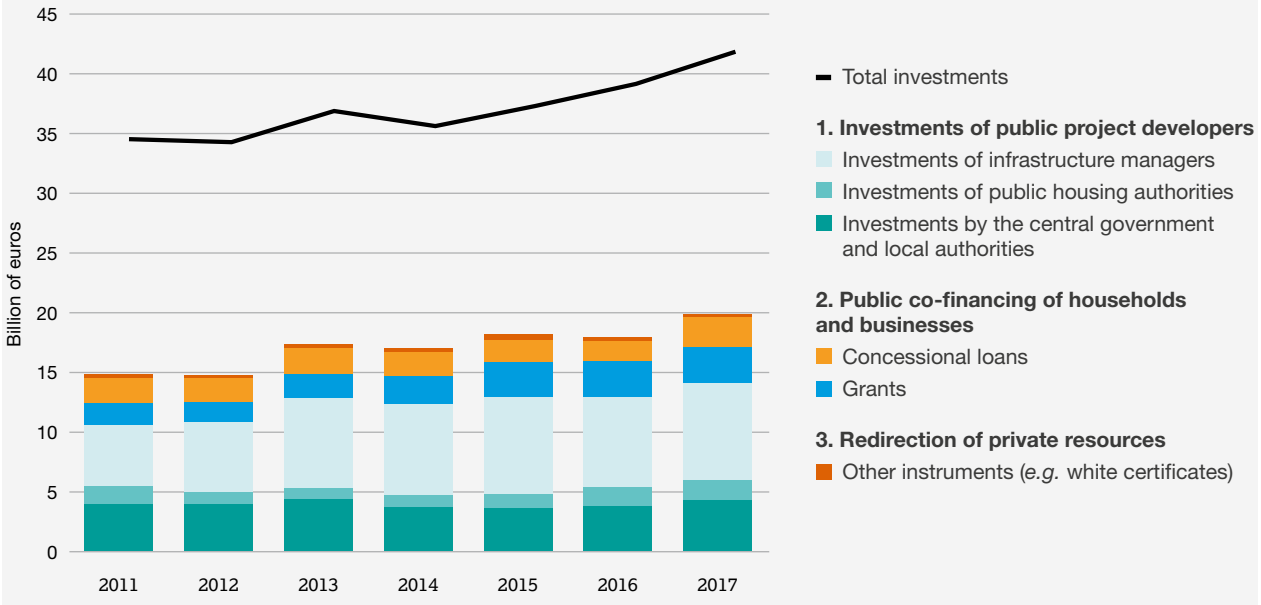
Public authorities are increasingly intervening to fund low-carbon investments

Public authorities intervene through several channels to fund climate investments. Their intervention goes beyond public budgets to include the mobilization of private funding :

1. **Firstly, investments are made by public project developers themselves** (see box on **page 5**). This includes investments by the central government and local authorities in their own building stock and vehicles fleet, local authorities and infrastructure managers (RATP, SNCF Réseau) in the development and maintenance of rail and urban public transport networks, and public housing authorities for the construction and the retrofitting of public housing. Together, this totalled 14.1 billion euros in 2017, using in turn 4 billion euros of financing from private banks (loans) and financial markets (bonds).
2. **In addition, public authorities co-financed projects initiated by household and private companies**. This co-financing came from the budgets of the central government and local authorities most often in the form of subsidies, and from public banks (Caisse des Dépôts, BPI France, EIB) in the form of concessional loans. Together, co-financing operations totalled 5.5 billion euros in 2017.
3. **Finally, public authorities supported the redirection of private capital to low-carbon projects** through mandatory mechanisms such as energy saving certificates (CEE), or voluntary programs such as the interest-free “eco-PTZ” loan proposed by commercial banks. These instruments totalled a modest 350 million euros in 2017.

Put together, these publicly-driven interventions contributed to the funding of 20 billion euros of investment and cofinance, or nearly half of the climate investments made in 2017.

CLIMATE INVESTMENTS AND PUBLIC SECTOR SUPPORT



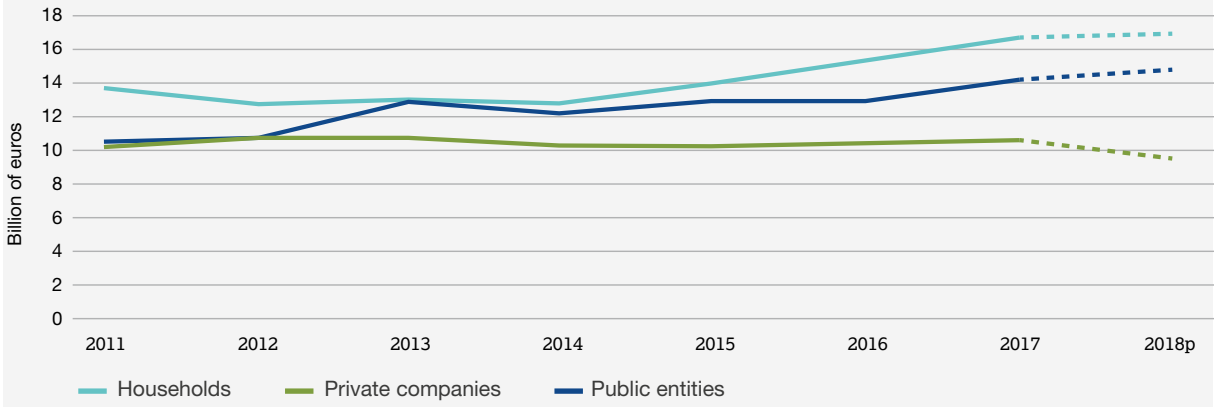
Source: I4CE, Landscape of climate finance in France, Edition 2018

From 2011 to 2017, contribution of public entities to climate investment increased by 5 billion euros.

The investment of public project developers has significantly increased, particularly in transport infrastructure through SNCF Réseau's retrofitting programme and projects led by the *Société du Grand Paris*. Co-financing levels have also increased between 2011 to 2015 with the deployment of support programs across the residential (CITE, ANAH), transport (*Bonus-Malus*), agriculture and industry (CEE, district heating) sectors. Since 2015, there has been an increase in the number of concessional loans, largely related to the activity of BPI France and the EIB in providing co-financing to renewable energy project developers.

HOUSEHOLDS ARE THE PRINCIPAL PROJECT DEVELOPERS IN FRANCE, FOLLOWED BY PUBLIC ENTITIES AND COMPANIES

CLIMATE INVESTMENTS IN FRANCE, BY PROJECT DEVELOPERS



Source: I4CE, Landscape of climate finance in France, Edition 2018

Households accounted for 16.6 billion euros, or 40% of climate investments made in 2017 in France. Their investments were concentrated in the building sector for the construction and renovation of private dwellings, and in the transport sector with the acquisition of low-carbon passenger cars. Their investments have increased since 2014 in these two sectors.

Companies invested 10.5 billion euros in 2017. They were involved in all sectors and were responsible for almost the totality of investments in energy production, industry and agriculture. Their volume of investment was stable over the entire period, but is expected to decline in 2018.

Investments by public **project developers**, which include those of the central government, local authorities, public housing authorities, and infrastructure managers totaled 14.1 billion euros in 2017. Investments mainly occurred in the transport sector for the construction and maintenance of infrastructure. The amounts invested by public authorities have been increasing since 2011.

Climate-adverse fossil fuel investments represent more than 70 billion euros

Climate-adverse fossil investments perpetuate the production and consumption of fossil fuels in France. They reached 73.1 billion euros in 2017, almost twice the amount dedicated to climate investments that year.

Climate-adverse investments are concentrated in the transport sector

- The transport sector concentrated 71.4 billion euros of fossil fuel investment, by far the highest volume. These were principally for the acquisition of vehicles with internal combustion engine (ICE), including both passenger and heavy-duty vehicles.
- In the construction sector, climate-adverse investments included the installation of inefficient oil and gas boilers for an estimated total investment cost of about 800 million euros in 2017.
- Fossil investments in energy production totalled nearly 900 million in 2017. This included investments in fossil fuel extraction, infrastructure for importing gas, and the refining of petroleum products.
- Other climate-adverse investments not quantified in this study may have also occurred in France over the period studied. For example, attention should be given to investments in the construction sector that may not comply with efficiency regulations, the quality of housing retrofitting and, more generally, the management of urban sprawl.

Climate-adverse fossil fuel investments have increased by 12% since 2015

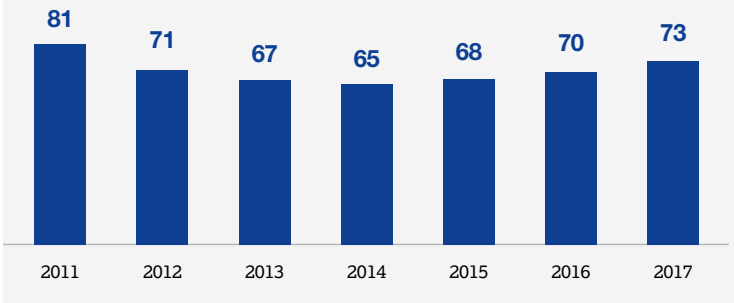
While climate-adverse fossil investments decreased between 2011 and 2014, they have been increasing since 2015, mainly in the ICE vehicle market.

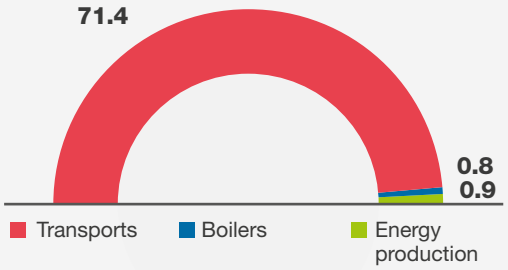
Most of these investments lock the country into importing fossil fuels for many years to come

In 2017, France's energy imports bill totalled 39.3 billion euros (source: SDES).

Note: not all investments made in fossil fuels today are misaligned with France's objectives and strategy to achieve carbon neutrality. The national strategy considers that some investments in gas networks (including high-performance boilers or natural gas vehicles) or in heating networks will be accompanied by progress in renewable energy sources such as biomethane, solar energy, and geothermal energy or biomass. These 'contributing' fossil fuel investments are covered as part of climate investment totals presented in the Landscape of Climate Finance report; they represented 7.5 billion euros in 2017.

CLIMATE-ADVERSE FOSSIL INVESTMENTS IN FRANCE (in billions of euros)

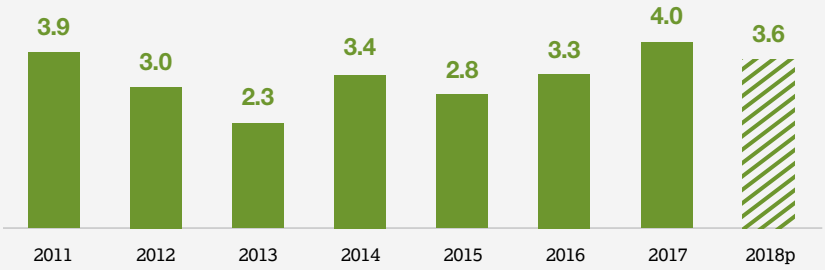




Source: I4CE, Landscape of climate finance in France, Edition 2018

Renewable power: investments rise, public investment banks become more involved in their funding

RENEWABLE POWER GENERATION



Climate Investments in 2017
4 billion euros

Gap with investment needs 2016-2020
1.1 to 2.3 billion euros per year

Publicly-driven finance in 2017
1.8 billion euros

Source: I4CE, Landscape of climate finance in France, Edition 2018

Investments in large renewable electricity generation facilities such as solar plants and wind turbines reached 4 billion euros in 2017

Since 2013, investments have been on the rise and is recovering from the drop in the first half of the 2010s. This trend is even more significant as the cost of installing certain technologies, such as solar, has decreased since 2011. Measured in MW installed, the activity of the sector is approaching its 2011 levels.

However, the first observable results indicate a decrease in investments in 2018, with an estimated total of 3.6 billion euros.

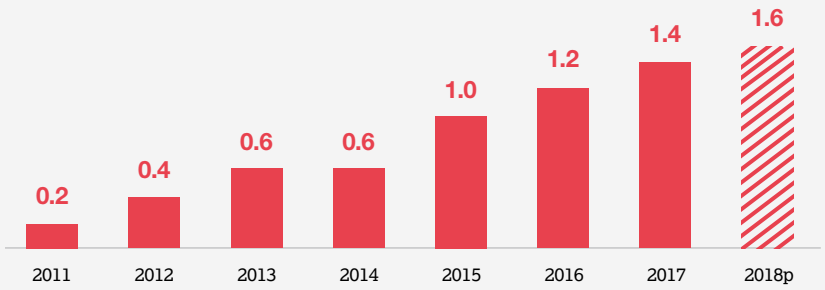
An investment gap for renewable power of between 1.1 and 2.3 billion euros per year

In this sector, investments are mainly carried out by private developers through special purpose vehicles (SPVs). The financing of SPVs relies on bank lending and on own funds held by developers or some local authorities through semi-public companies. While renewable power projects receive few subsidies at the time of investments, they often sell their electricity at a fixed tariff supported by the "Contribution to the public service of electricity" (CSPE) tax. For example, in 2015 producers' incomes amounted to approximately 6.2 billion euros, of which about 4.4 billion euros were financed from the CSPE (source: CGDD, *Compte monétaire de l'électricité*).

Loans from BPI France and credit lines from the EIB to renewable power has increased significantly since 2011, totalling 1.8 billion euros in 2017.

Despite a six-fold increase since 2011, investment in low-carbon vehicles remains below needed levels

LOW-CARBON VEHICLES



Climate Investments in 2017
1.4 billion euros

Gap with investment needs 2016-2020
5 to 6 billion euros per year

Publicly-driven finance in 2017
400 billion euros

Source: I4CE, Landscape of climate finance in France, Edition 2018

Investments in low-carbon vehicles have increased every year since 2011, from 240 million to 1.4 billion euros

- Investments in electric passenger cars totalled nearly 780 million euros in 2017; however, their share in total car sales only reached 1.74% compared with 0.12% in 2011. The main buyers of electric cars are households.
- Investments in electric, hybrid and natural gas (NG) buses totalled 275 million euros with NG garbage collection vehicles represents 180 million euros. Their deployment is typically assured by local governments and urban public transit operators.
- Electric, hybrid and NG commercial vehicles and trucks drew investments of about 200 million euros, mainly invested by logistics and infrastructure maintenance companies.

The growth of investments in low-carbon vehicles is projected to continue in 2018, estimated at a total of 1.6 billion euros.

Despite this rapid progress, the deficit of investment in low-carbon vehicles remains considerable

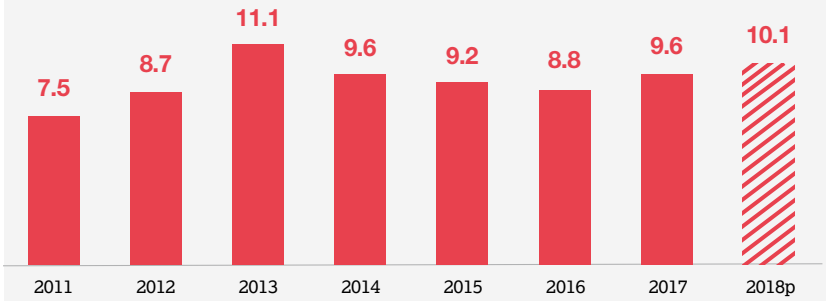
For private electric vehicles and NG heavy-duty vehicles, the deficit of investment ranges between 5 and 6 billion euros per year, nearly 8 times their current level of investment. However, these needs should be compared to the 58 billion euros invested in 2017 for the acquisition costs of ICE vehicles (see **page 6** on climate-adverse investments). If the extra purchasing cost of electric vehicles compared to thermal vehicles has dropped since 2011, it remains an obstacle to the redirection of investments, combined with the lack of accessibility to charging infrastructure and the real and perceived limited autonomy of the vehicles.

Public authorities intervened in the acquisition of low-carbon vehicles, funding up to 400 million euros in 2017

This total includes 230 million euros invested in public vehicle fleets, such as buses for urban public transport or garbage collection vehicles, and 170 million euros of subsides given to household and private companies.

Transport infrastructure: current historically high investment levels need to be maintained in the long-term

TRANSPORT INFRASTRUCTURE



Climate Investments in 2017
9.6 billion euros

Gap with investment needs 2016-2020
Less than 0.3 billion euros per year

Publicly-driven finance in 2017
9.5 billion euros

Source: I4CE, Landscape of climate finance in France, Edition 2018

Investments in low-carbon transport infrastructure reached 9.6 billion euros in 2017

While investments have been stable since 2014, preliminary results for 2018 suggest a modest increase. For the most part, the investments support rail and urban public transport infrastructure and are undertaken almost exclusively by public authorities through infrastructure managers (SNCF Réseau, RATP, *Société du Grand Paris*) or local governments. Central government and local authorities intervene in funding these projects through grants and endowments.

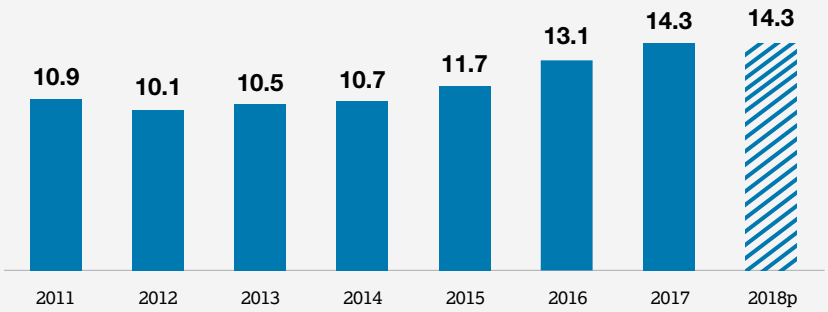
Current levels of investments are in the range estimated to be needed by the SNBC and PPE

While current levels are in line with future needs, it must be ensured that investments today support the significant modal shift needed in the transport sector.

In addition, achieving the objectives of the SNBC and the PPE will require that these levels of investment continue over several decades. This raises the question of the sustainability of the current funding model principally based on public resources.

Housing energy retrofitting: deficits persist despite a significant increase in investments since 2014

HOUSING ENERGY RETROFITTING



Climate Investments in 2017
14.3 billion euros

Gap with investment needs 2016-2020
5 to 8 billion euros per year

Publicly-driven finance in 2017
4.2 billion euros

Source: I4CE, Landscape of climate finance in France, Edition 2018

Investments in housing retrofitting reached 14.3 billion euros and have increased since 2014

Investment growth is concentrated in the installation of efficient windows and doors, gas condensing boilers, wood energy and heat pumps.

Several factors could explain this notable growth, such as: more stringent regulations for equipment manufacturers; the improvement of workforce skills; the strengthening of public assistance programs; and the economies of scales achieved in the social housing segment.

In addition, after two years of declining fossil fuel prices (2014-2016), the rise in fuel prices combined with the French carbon tax may lead to a recovery for the housing retrofitting markets. In 2018, professionals anticipate stable levels of activity in the insulation markets, and modest increase in the sales of renewable heating equipment.

However, the growth of the renovation market remains below ambitious targets for this sector

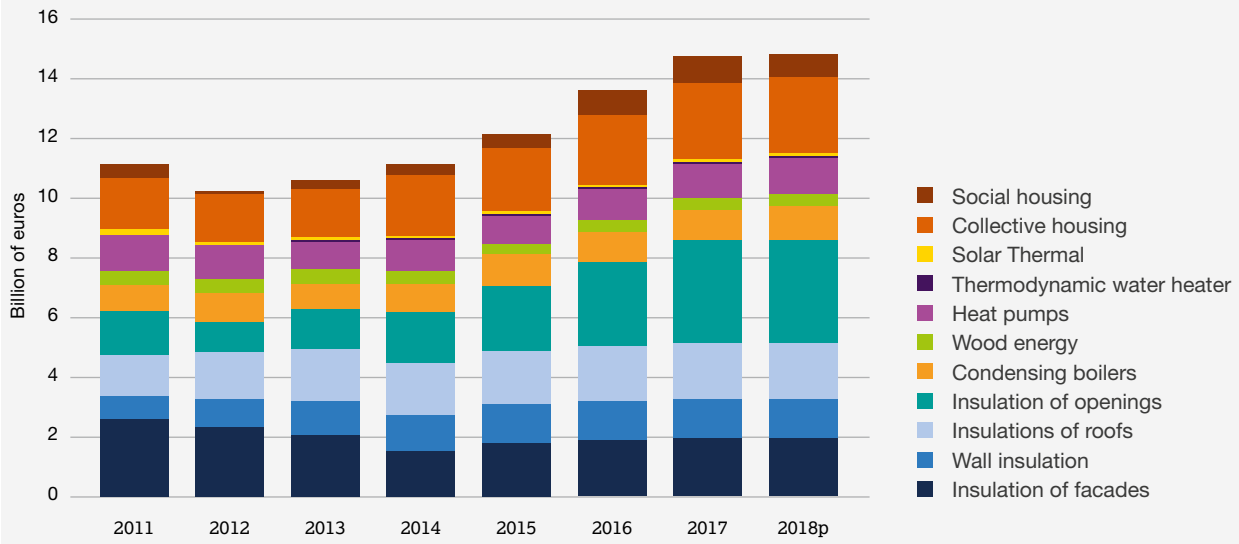
The annual investment gap in this sector ranged between 5 and 8 billion euros. Bridging it would require a 35 to 60% increase in annual investments. However, beyond the quantitative target, the quality of retrofitting projects themselves is seen as an essential part the SNBC. Matching this ambition would require a shift in the type of works conducted with more investments going to the insulation of roofs, walls, and facades – as well as renewable heat production (solar, geothermal, heat pump, biomass).

Support from public authorities reached 4.2 billion euros

Public support for households has been stable at around 3.3 billion euros per year since 2015. The rise in investments therefore translates into an increase in the use of household equity and commercial loans. This trend is encouraging given that it is often seen as important for more effective public aid and incentive schemes to channel private finance to help fulfil investment needs. However, subsidies are seen as necessary in some cases to address “market failures”, such as in the case where tenants and households in energy poverty are called to invest. In addition to public support, the financing of renovations is covered by household equity of upwards of 7.4 billion euros in 2017; followed by commercial bank loans of upwards of 3.2 billion euros.

Energy retrofitting programs for social housing, launched in 2011 and accelerated 2016 by concessional loans from the Caisse des Dépôts, maintained a high level of activity at an estimated 930 million euros in 2017.

CLIMATE INVESTMENTS IN HOUSING RETROFITTING IN FRANCE, PER SECTOR AND EQUIPMENT TYPE
(details on equipment for single family homes only)

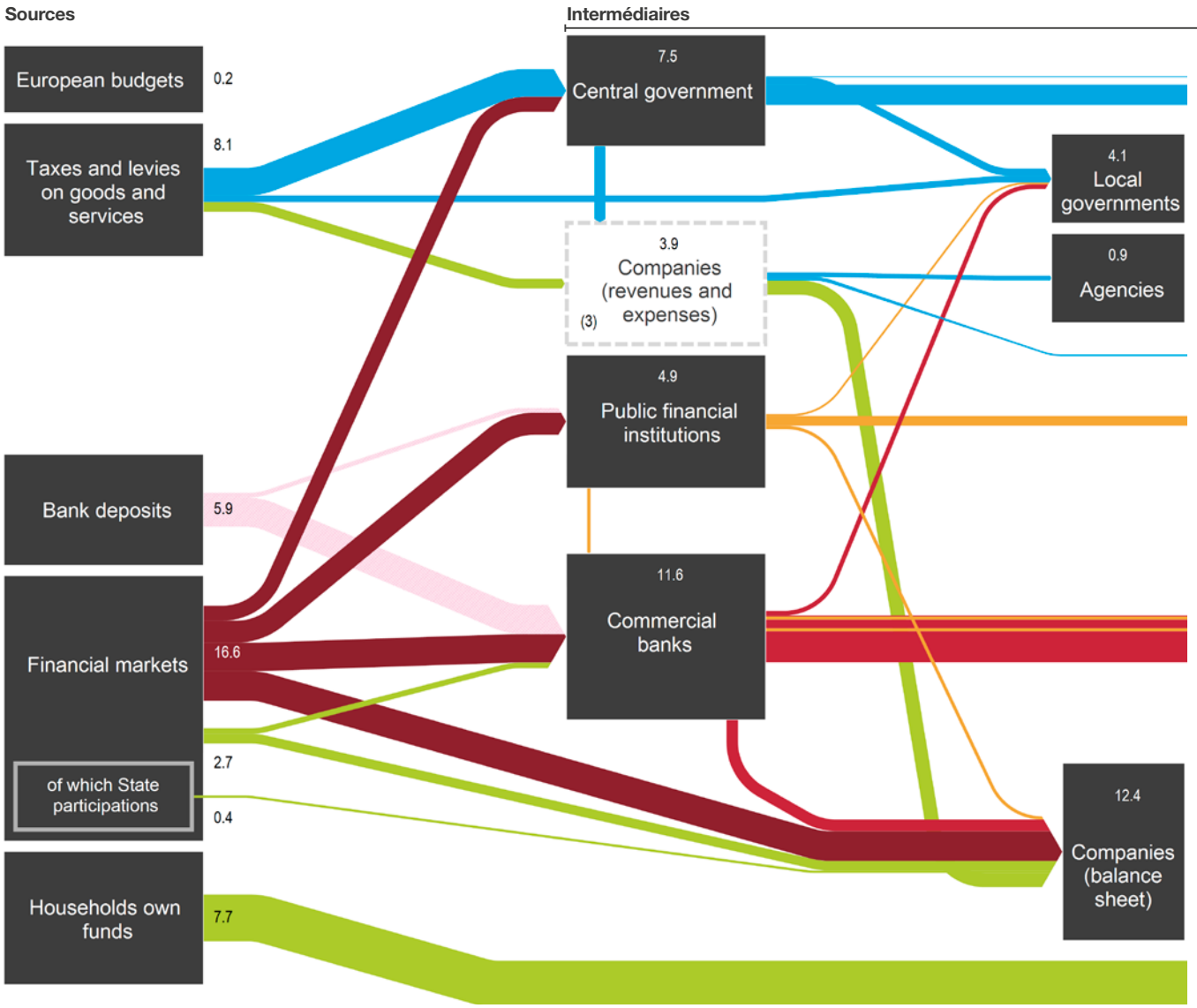


Source: I4CE, Landscape of climate finance in France, Edition 2018

Note 1: In this edition, changes occurring in available sources led the authors to expand the scope of the investments selected and to re-evaluate the roof and facade insulation market to 3.2 billion euros in 2013, compared to 1 billion euros in the previous edition.

Note 2: The financing of the reduced VAT rate for equipment contributing to the energy efficiency of housing is included in climate finance totals. However, the effective VAT rate is used in the estimates of total investments presented above.

The domestic landscape of climate finance, a powerful tool to track and monitor low-carbon investments



The Landscape of Climate Finance maps investment in tangible (physical) assets securing reduction of GHG emissions in France. This includes construction and equipment acquisition costs and some durable goods as used in national accounts (e.g. vehicles). This excludes the costs of, preparatory studies, operating costs, administrative costs and public procurement costs. Debt represented on the flowchart includes loans and bonds issued by or to project developers, but does not include the reimbursement of previously borrowed funds.

Acronyms:

NE = not estimated

<.1 = amounts of less than €100 million.

To maintain clarity, these amounts are not represented graphically but are still included in the total of each box.

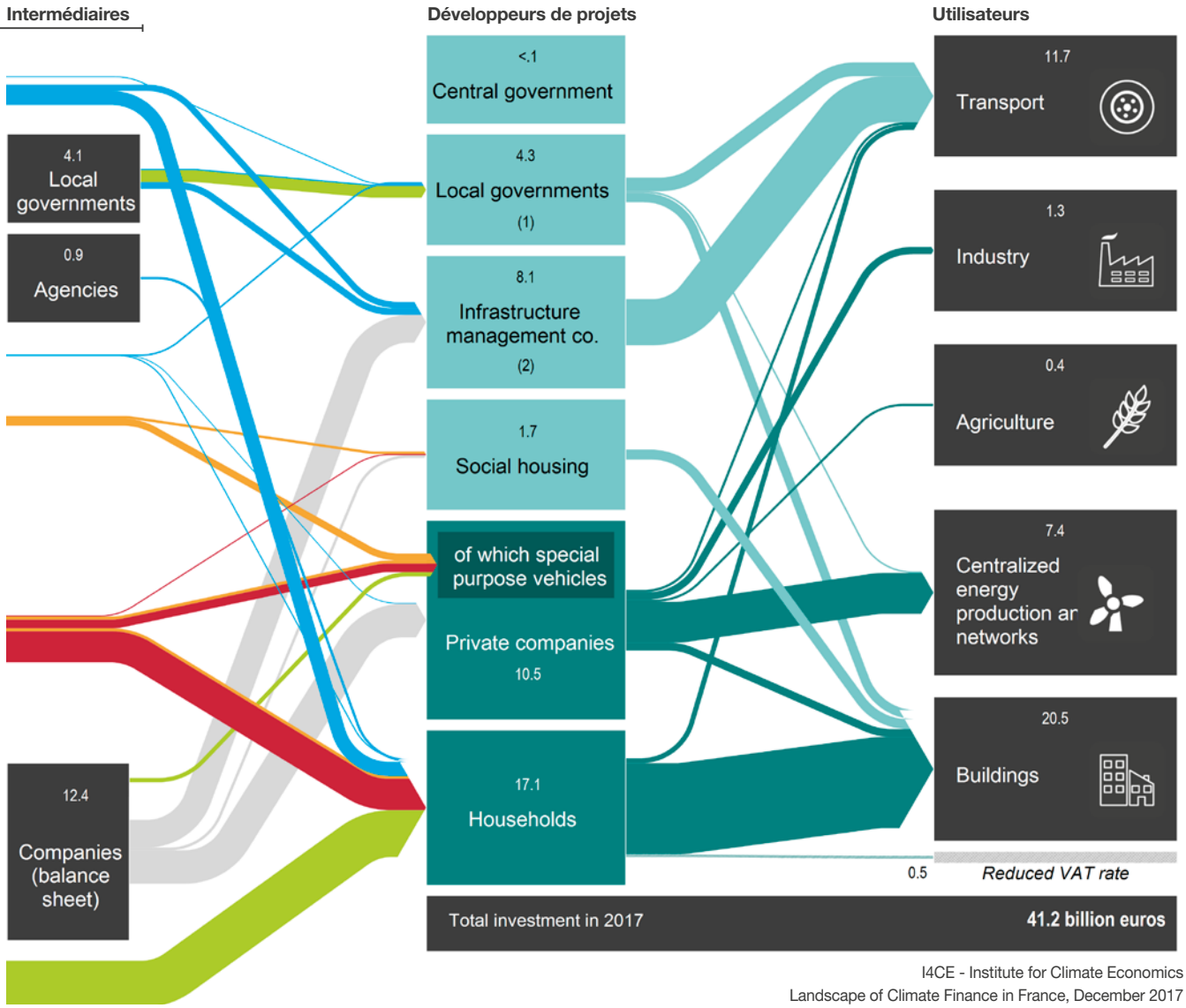
(1) As project developers, i.e. investing in their own buildings or durable goods. Local governments include public transport authorities ("autorités organisatrices des transports", or AOT).

(2) Public operators include SNCF Réseau (know up to 2014 as RFF), Voies Navigables de France (VNF) and RATP for investment in public transport infrastructure in the Ile de France region.

(3) Consumption of goods and services on which levies are raised. Proceeds from these levies are dedicated to the financing of low-carbon investment. This includes the transport levy ("versement transport"), carbon auction revenues and the value of white certificates (CEE).

The main sources of climate finance are:

- Public fiscal revenues, European budgets, and use and service
- charges mainly directed to the national and local governments;
- Financial markets, providing capital in the form of debt or equity to public and private intermediaries or directly to project promoters;
- Self-financing of projects by households.



I4CE - Institute for Climate Economics
Landscape of Climate Finance in France, December 2017

Instruments de financement

- Dépôts des ménages
- 7,3 Aides, subventions et versements
- 15,3 Fonds propres et autofinancement
- 4,8 Dette concessionnelle
- 9,4 Dette commerciale
- 4,9 Dette obligataire
- Financement par bilan

Investissements

- 14,1 Investissements publics
- 27,1 Investissements privés

To finance their investments, project developers employ four main types of instruments:

- Grants, subsidies and transfers, that include no financial obligation for the beneficiary;
- Concessional debt, in the form of loans with better interest rate, maturity or guarantees than market-rate debt;
- Commercial debt, loans issued by private banks at market conditions;
- Equity, in the form of the project developer's own funds and resources, generally mobilized without an intermediary.

For companies (public or private), debt and equity are often raised at the corporate balance sheet level, while special purpose vehicles use principally non-recourse financing.

Public and private project developers are typically the owners of the assets generated by the investment. Their investments are made in several sectors; each sector can include actions in one or more uses related to climate change mitigation and the energy transition, such as energy efficiency, development of renewable energies or the building of sustainable infrastructure.

The Landscape of Climate Finance only aggregates spending and funds engaged at the time of the investment (capital expenditure). Some financial instruments contributing to a project's financial profitability during its lifetime, such as carbon pricing systems or feed-in tariffs for renewable energy, are not represented on the flowchart.

I4CE
INSTITUTE FOR CLIMATE ECONOMICS
Une initiative de la Caisse des Dépôts et de l'Agence Française de Développement

www.i4ce.org

Création-réalisation : SophieBerlioz.fr