

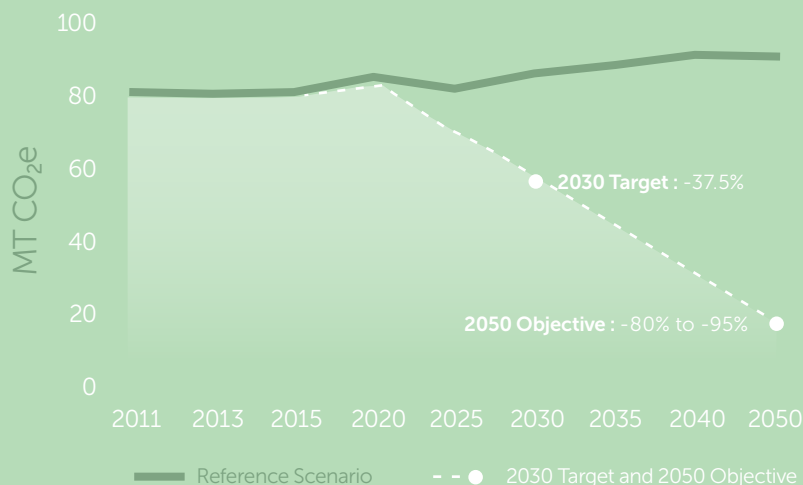
# Decarbonising Quebec

To access the full (French-language) report:  
<http://www.environnement.gouv.qc.ca/changementsclimatiques/plan-action-fonds-vert.asp>

Quebec is committed to reducing its GHG emissions by 2030, but how do we get there? At the request of the Quebec government, a study was conducted to evaluate the options for reducing GHG emissions, as well as the implications of these actions for Quebec.

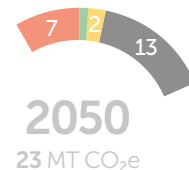
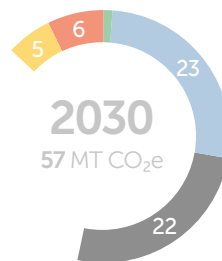
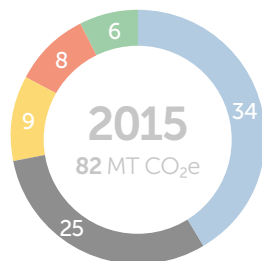
Quebec's **reduction target for 2030:**

# -37.5%



## Emissions by Sector (MT CO<sub>2</sub>e)

- Transportation ●
- Industry ●
- Waste ●
- Agriculture ●
- Buildings ●



## The Carbon Challenge, and Opportunity

The study concludes that the **2030** target is achievable through domestic emissions reductions. For this, an unprecedented effort is required to:

- increase energy efficiency;
- replace imported fossil fuels, primarily with renewable electricity from Quebec and;
- adopt new practices in the transportation, agriculture and waste sectors.

Quebec's **reduction objective for 2050:**

# -80% to -95%

According to the Dunsky study, currently-available or anticipated technologies could meet most of Quebec's 2050 objectives. Reduced energy needs and new technological innovations can help ease the transition and allow us to go further.

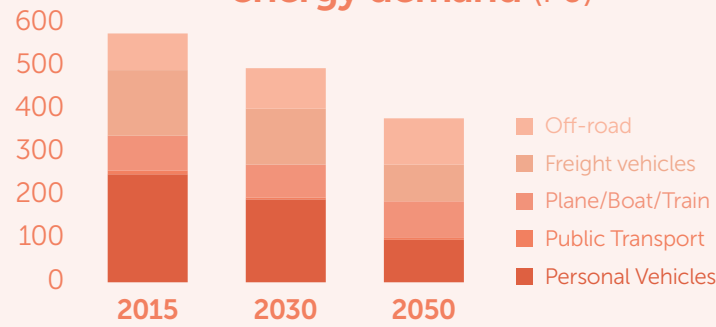
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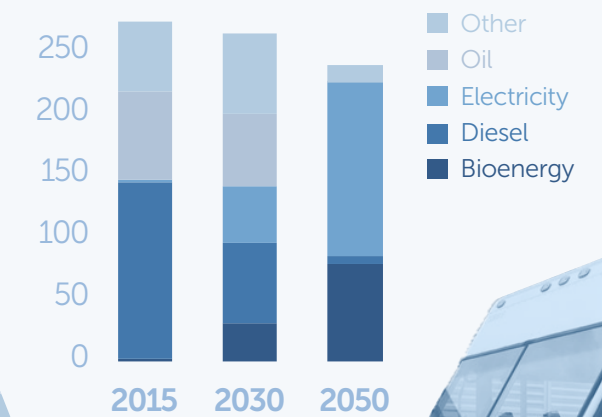
As the first pillar of the transition, managing energy requires increased energy productivity in Quebec's economy. More efficient buildings and heating, recovery of heat lost in factories, public transportation and land-use planning all help the Quebec economy to do more with less energy. Electric motors for vehicles, vastly more efficient than internal combustion engines, can further reduce total energy demand.

More and more manufacturers, including Quebec-based firms, are bringing to market heavy-duty electric vehicles. Quebec could use a combination of tools – financial assistance, innovative financing, lead-by-example and regulation – to ensure their rapid introduction on Québec's roads.

Evolution of transportation energy demand (PJ)

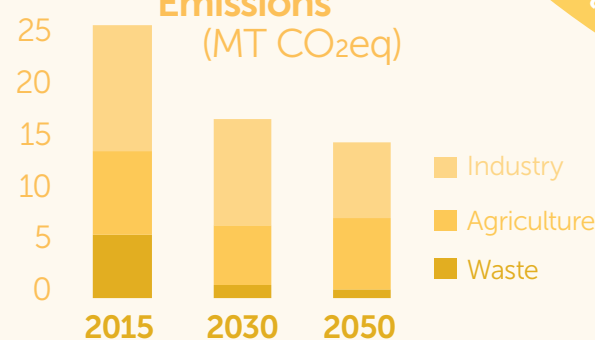


Evolution of energy demand for freight vehicles (PJ)



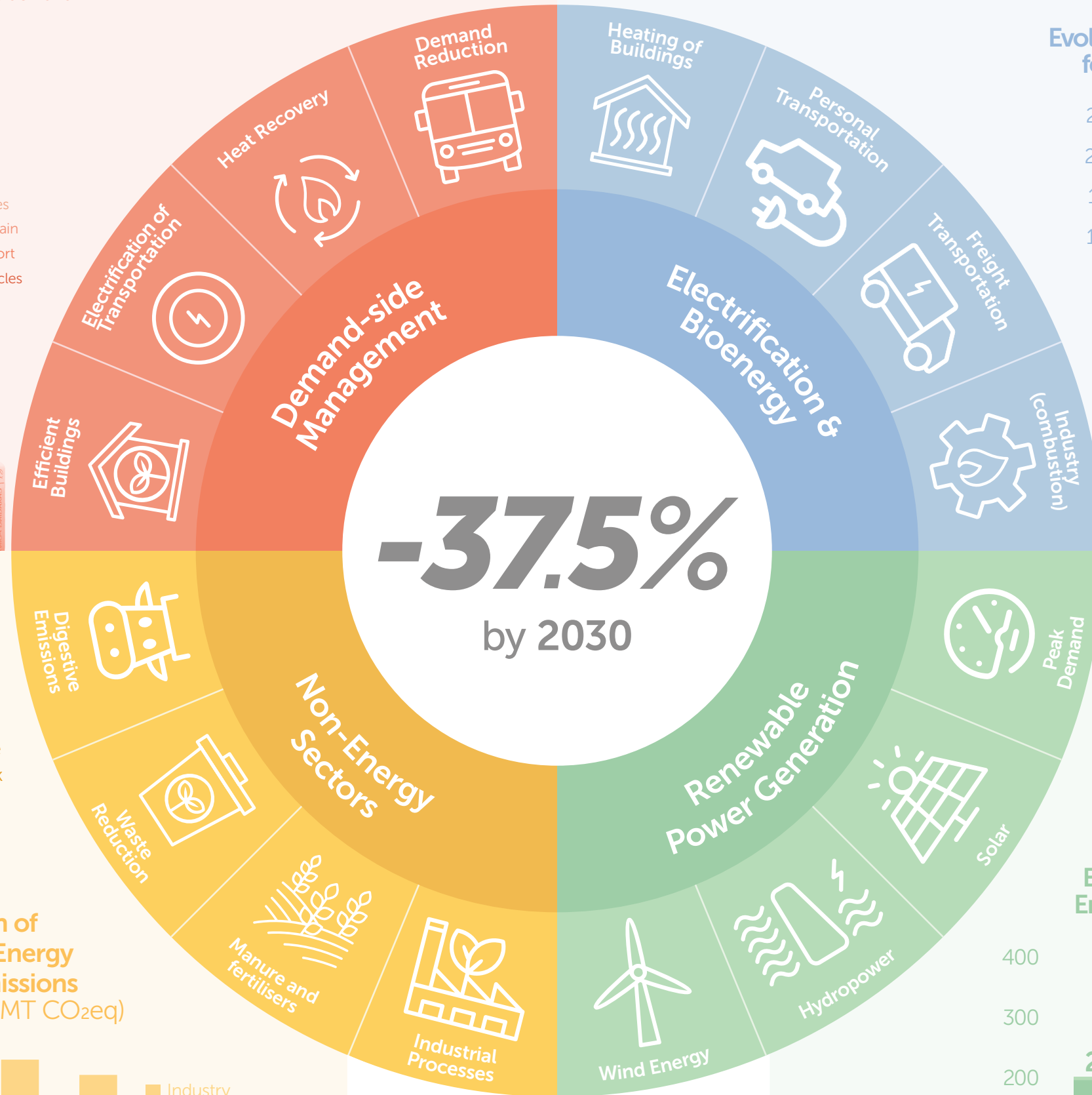
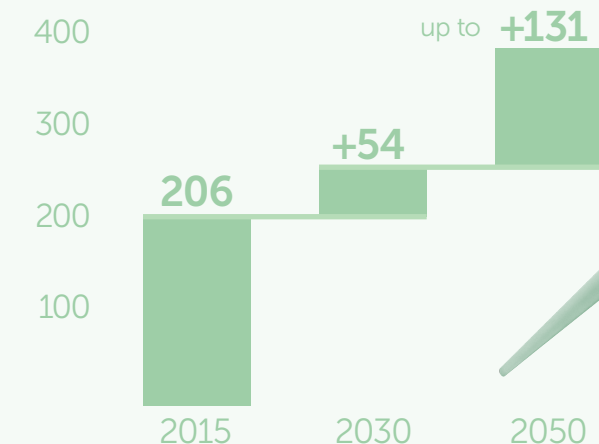
Among non-energy emissions, those from waste can be reduced fastest, mainly by accelerating the rates of composting and anaerobic digestion. In terms of industrial processes and agriculture, efforts in innovation – from research to deployment – are needed. New processes for the production of low-carbon aluminum, the use of alternative cements and new feedstocks for livestock are promising.

Evolution of Non-Energy Emissions (MT CO<sub>2</sub>e)



Previously, Quebec's advantage in electricity was limited to hydropower. Today, dramatic declines in wind and solar energy costs, combined with new peak management opportunities, are increasing the potential for other renewable electricity generation. Quebec could significantly increase its production of renewable electricity – by 50% to 100% – to replace imported fossil fuels.

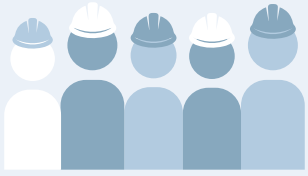
Evolution of Renewable Energy Production (TWh)



# Economic Opportunity

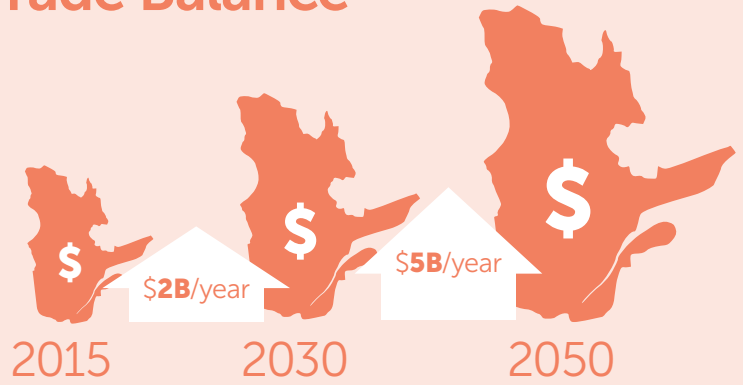
**\$10 Trillion/year**

Global market in **2030** for low-carbon technologies and services



By stimulating innovation, Quebec's businesses can position themselves in a growing market

# Improving Quebec's Energy Trade Balance



# Health and Environment



## Air-Quality Improvements

Positive effects on air-quality, and as a result, on the health of Quebecers.

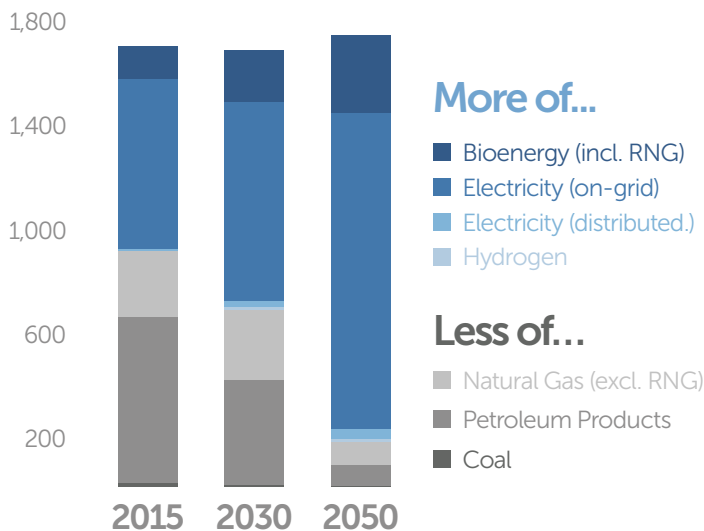


## Caution

Development of renewable energy sources must be done consciously, with respect for ecosystems and communities

# Quebec's strengths lend themselves to a successful transition:

## Final Energy Consumption (PJ)



### More of...

- Bioenergy (incl. RNG)
- Electricity (on-grid)
- Electricity (distributed.)
- Hydrogen

### Less of...

- Natural Gas (excl. RNG)
- Petroleum Products
- Coal

**Low-carbon electricity:** one of the rare regions where electricity is already decarbonized

**Electric heating:** one of the rare regions where electrification of heating is largely underway

**Zero fossil-fuel energy production:** an economy with zero dependence on the extraction of fossil fuels

**Abundant resources:** an immense territory with significant hydro, wind, solar, and biomass resources

**Know-how:** Robust industrial fabric and cutting-edge expertise in renewable energy and electrification

**In short, Quebec's inherent strengths are aligned with this vast decarbonization effort.**

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