



*The webinar will begin shortly...*

*GGKP Webinar on Decarbonizing Development:  
Three Steps to a Zero-Carbon Future*

*28 May 2015*

*Need technical support? Email: [contact@ggkp.org](mailto:contact@ggkp.org)*

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Schweizerische Eidgenossenschaft  
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*The Green Growth Knowledge  
Platform is financially supported  
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Climate Change and Development Series

# DECARBONIZING DEVELOPMENT

Three Steps  
to a  
Zero-Carbon  
Future

# Motivation

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- A lot of talk about 2oC but limited awareness of implications
- Planning targeted to the medium term
- Debate excessively focused on carbon pricing and a few green financial products

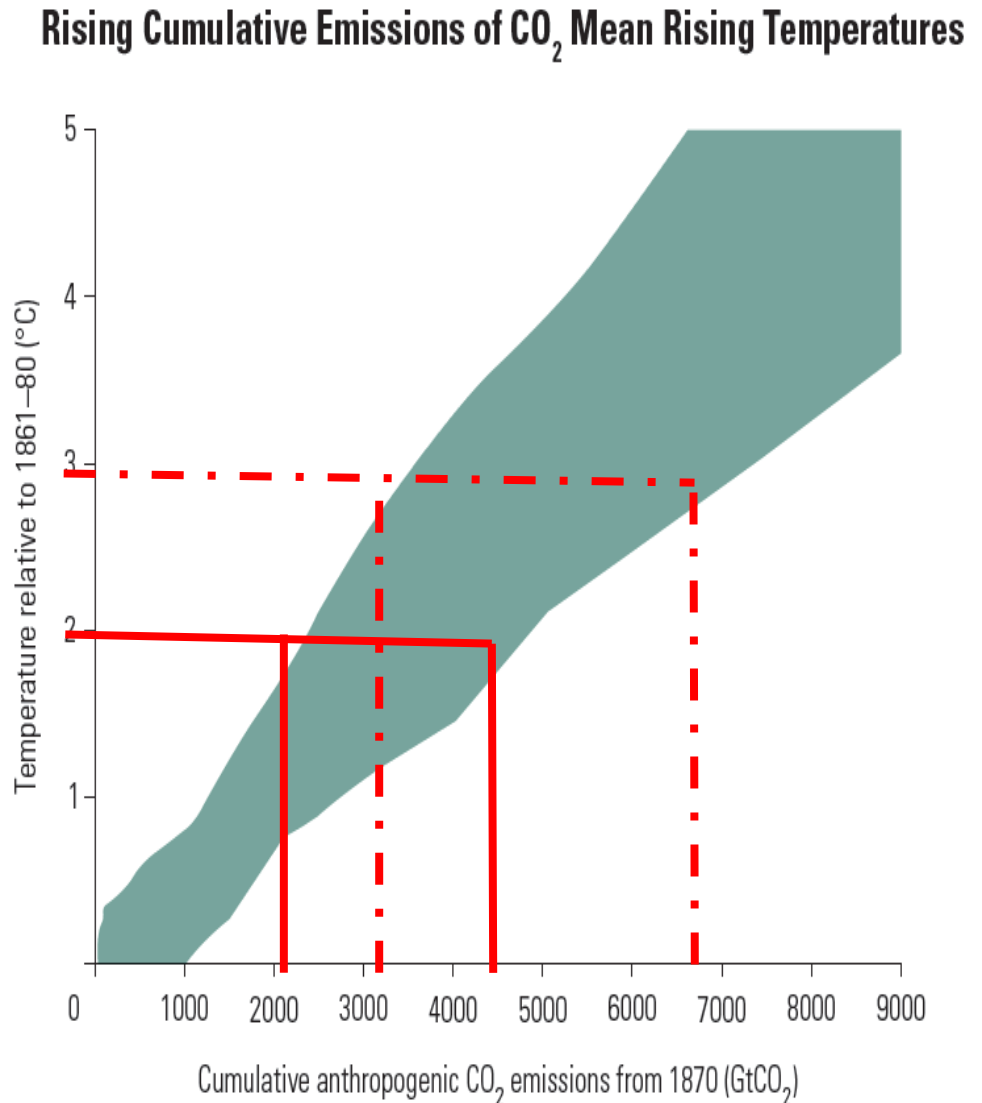
Self evident?

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Stabilizing the Climate  
=  
Full Decarbonization

# The future is carbon free

- For any temperature limit, there is a maximum CO<sub>2</sub> budget
- So CO<sub>2</sub> emissions have to go to zero at some point
- The question is *when* and *how*?



# Three steps to a zero-carbon future

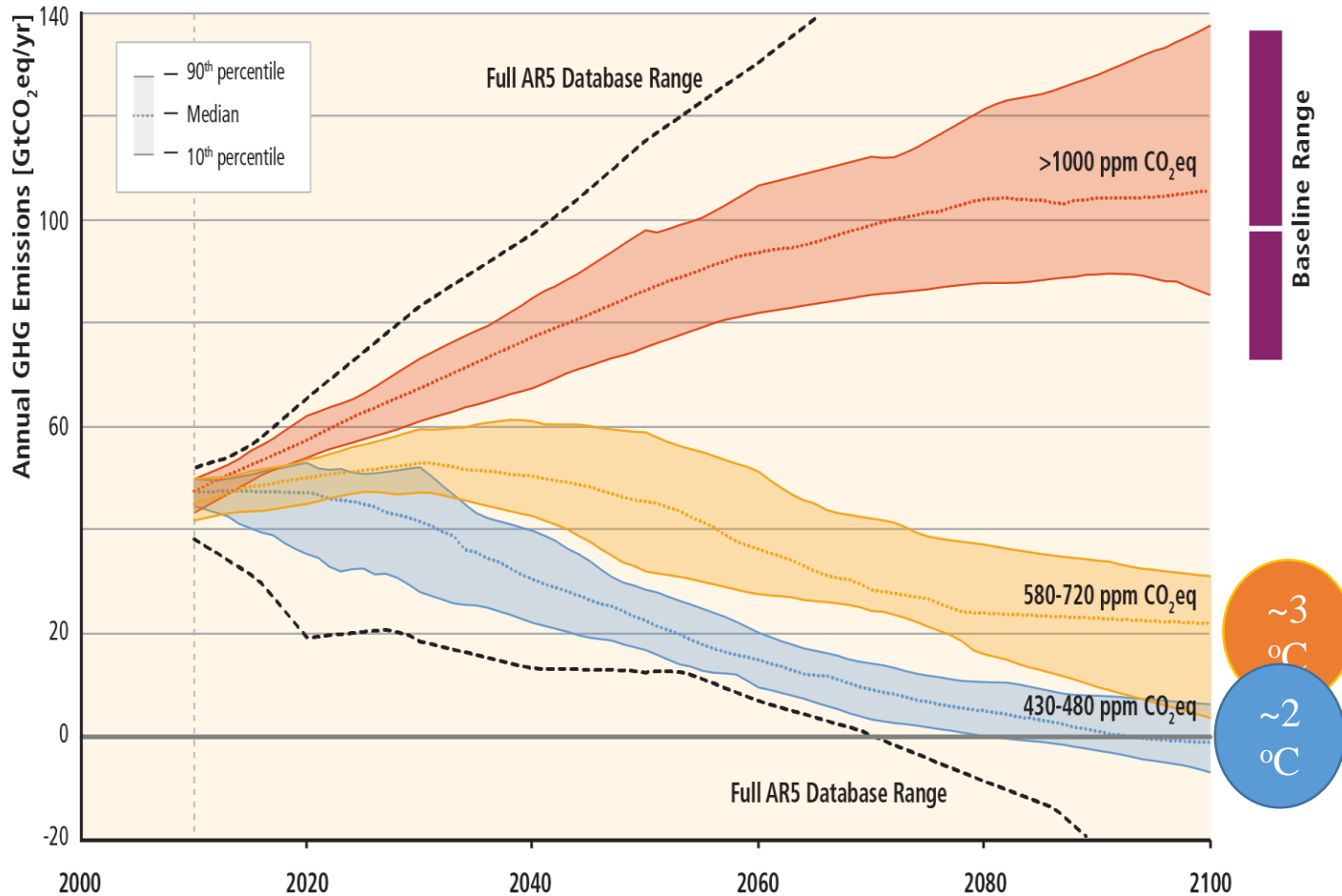
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- Step 1 – Plan ahead for a future with *zero* emissions
- Step 2 - Getting carbon prices *and complementary policies* right
- Step 3 - Mind the *political* economy and *smooth the transition* for those who stand to be most affected

Step 1 – Plan ahead for a  
future with zero  
emissions



# When? By the end of the century



# How? We know what it will take

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Decarbonization  
of electricity  
generation, i.e.  
renewable and/or  
Carbon Capture  
and Sequestration



Fuel shifting  
(especially to  
electricity) in  
transport,  
heating, and  
industries



Efficiency in all  
sectors, including  
building,  
transport, and  
agriculture



Preservation and  
increase of  
natural carbon  
sinks

- *Beware of marginal changes that do not lead to the long-term goal.*
- *Progress is required on high-potential measures, and in each of the four pillars*

## Sectoral indicators help track progress along the four pillars of decarbonization

**TABLE 3.2** Examples of Possible Sectoral Targets for Tracking Progress toward the Decarbonization End Goal

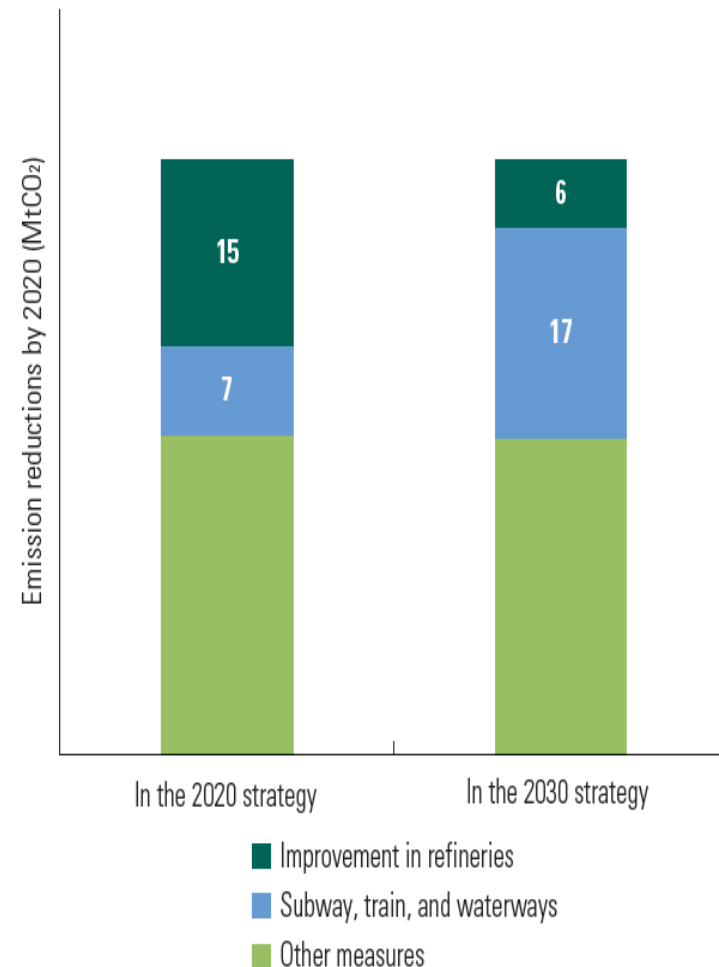
Pillar	Sector	Example of target	Rationale
Decarbonization of electricity production	Power generation	Produce at least 30% of electricity from renewable sources by 2025	This type of target prevents the power sector from locking into intermediate solutions, such as gas power or enhanced coal power, which do not have the potential to fully decarbonize the power sector. It also supports the development of the required technologies (e.g., solar photovoltaic and smart grid able to manage intermittency).
	Transport	Get 50% of the population to commute by public transport (bus) in 2025 in a city	At city scale, this target helps reduce energy expenditures, congestion, and local pollution, in addition to lowering CO <sub>2</sub> emissions and building zero-carbon cities. Accessible public transit can also influence household localization choices, which have long-term consequences on energy and carbon efficiency.
	Building	Build 50% of zero-energy buildings in 2030	Zero-energy buildings are needed for full decarbonization, and reduce energy bills and increase comfort. Early action is needed given the long lifetime of buildings.
Efficiency	Cities	Plan for dense cities	Urban sprawl is mostly irreversible and locks inhabitants into carbon-intensive pathways as it makes it much more difficult to develop viable public transit systems.
	Transport	Reach 1% of electric vehicles in 2015	Favoring electric vehicles prevents locking into marginal improvements of combustion engines, and contributes to total decarbonization as long as the electricity sector is being decarbonized at the same time.
	Buildings/forestry	Use 20% of sustainable wood in new building structure by 2025	Wood construction contributes to reaching zero carbon, if wood is produced sustainably. It is one of the options to reduce emissions from construction materials.
Natural carbon sinks	Forestry	Stop deforestation by 2017	Deforestation (and associated loss of ecosystem services) is largely irreversible, so action in this domain cannot wait.

# The zero-emission goal determines immediate needs for action

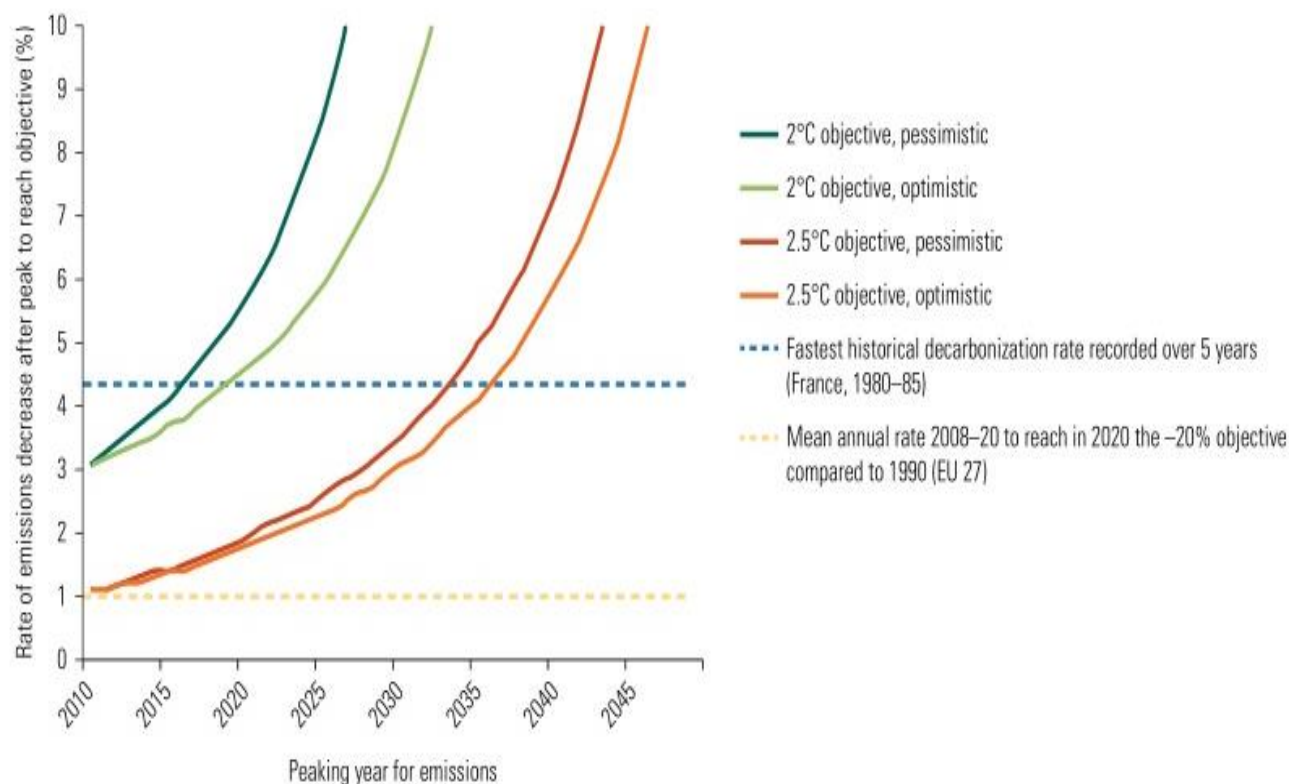
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## Using a Longer Time Frame Changes the Optimal Policy Mix for Brazil

- A case study on Brazil highlights the difference in strategy between a marginal and a structural change
- To get to zero emissions, we need to start now to:
  - Develop and test needed technologies
  - Redirect investments in long-lived equipment
  - Improve land use and urban development



# A late start entails more drastic emission cuts later



Source: Adapted from Guivarch and Hallegatte (2013).

Note: Peak year refers to the year in which emissions have reached their highest level and start to decline. Delaying the peak year by just a few years, say from 2010 to 2020, entails increasing the rate of annual emissions reduction from 3 percent to 4.5–5.5 percent. The figure also reports the fastest historical decarbonization rate achieved over a five-year period (outside of periods of economic collapse) and the decarbonisation rate implied by the European Union's commitment between 2008 and 2020. EU = European Union.



# There are many co-benefits

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# There are many co-benefits

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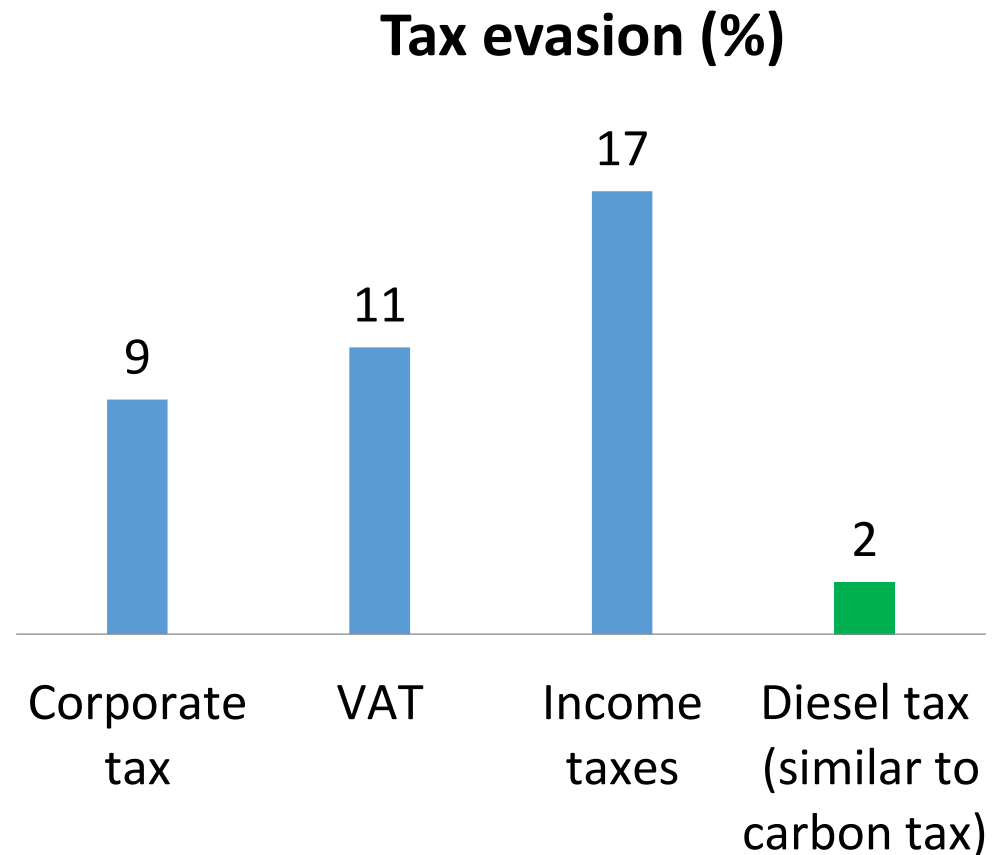
Step 2 - Getting carbon  
prices *and complementary*  
*policies* right



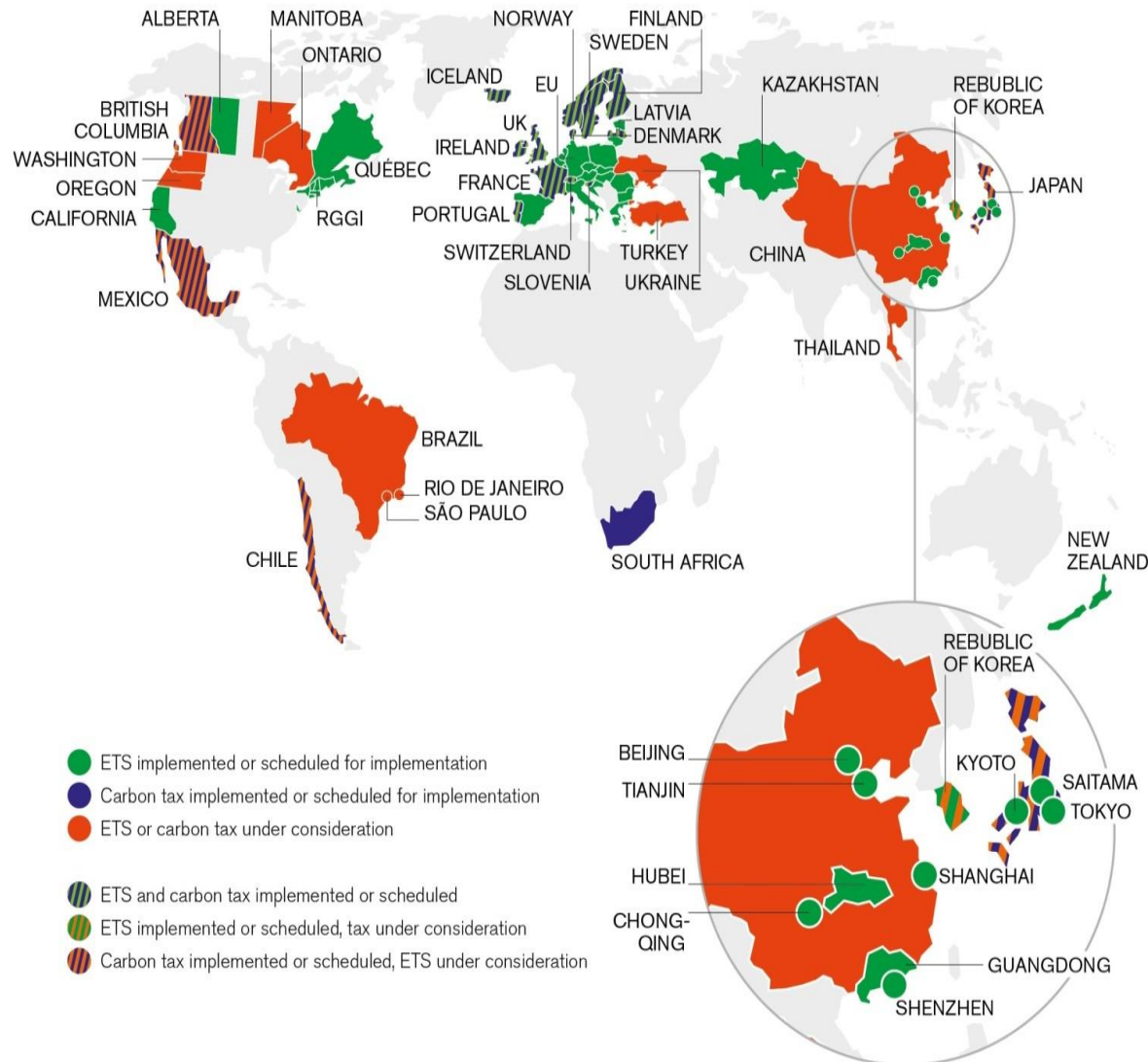
# Tax the bads, not the goods!

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- Getting prices right is good  
fiscal policy: a carbon tax  
can generate revenues  
efficiently
- Better to tax energy  
consumption or emission  
rather than jobs or  
investments
- And evasion is more difficult
- This is even more important  
in low-income countries  
with weak institutions



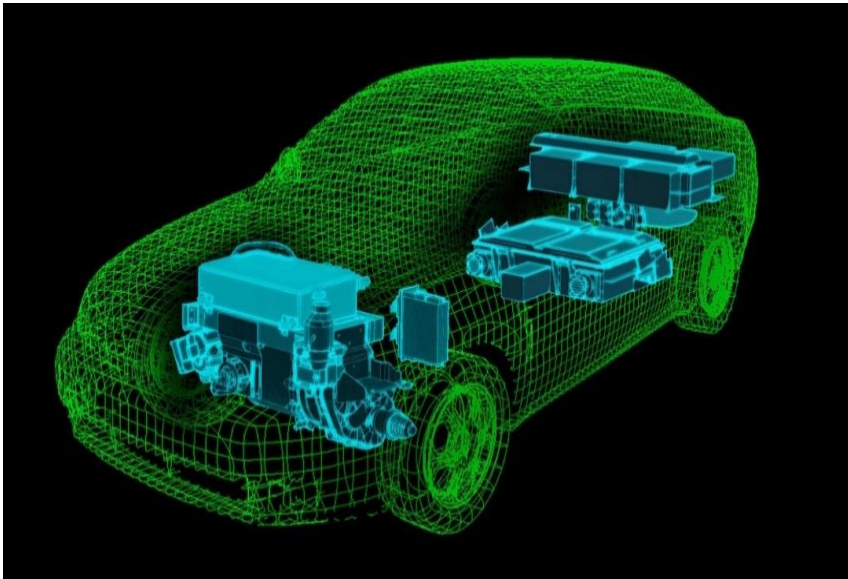
# Good news: progress on carbon pricing



# *Prices are not enough:* Subsidies for green R&D

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Green innovation faces the same challenges than any innovation, and requires the same type of support

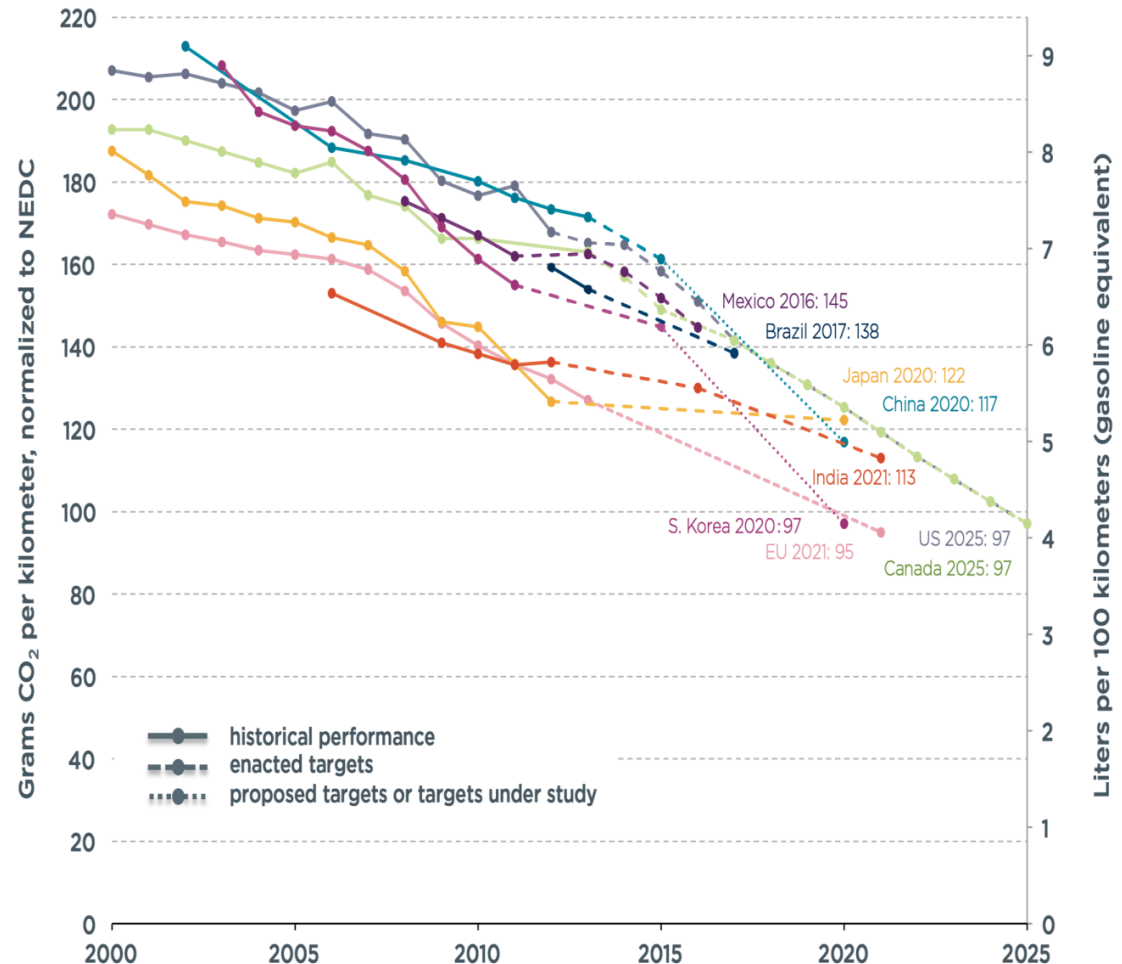


It makes sense to pay a **higher price per abated ton** than average when using higher potential technologies or solutions

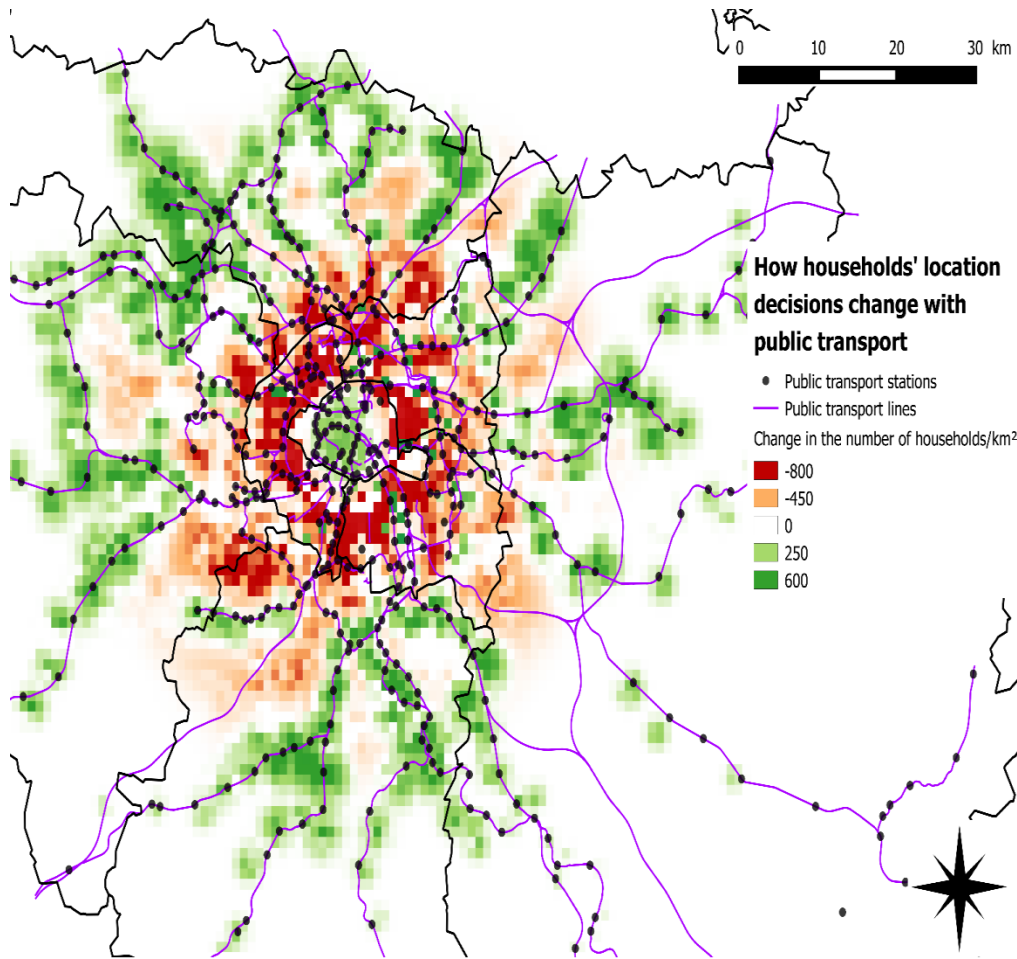
# Prices are not enough: **act on new investments**, to make sure they are energy-efficient

Options include:

- CAFE standards and fiscal incentives on cars,
- efficiency standards on buildings and home appliances
- feed-in tariffs for renewables



# *Prices are not enough:* develop the right infrastructure



- In a case study of Paris, we find that without the metro system...
  - Transport would emit twice as much CO<sub>2</sub>
  - A carbon tax would be half as efficient
- Urban planning and public transport are critical.
- But infrastructure financing remains challenging

# *Prices are not enough:* Inform and promote the right behaviors



Step 3 - Mind the political economy and smooth the transition for those who stand to be most affected



# The political economy is key

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Carbon price impacts  
negatively the value of  
polluting assets...

... you do not want carbon  
pricing if you just bought...



# In fact, climate policies will be successful only if they contribute to development and poverty reduction

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- Climate policies can be designed such that poor people benefit
- Revenue-raising policies makes it possible to invest in development and poverty reduction

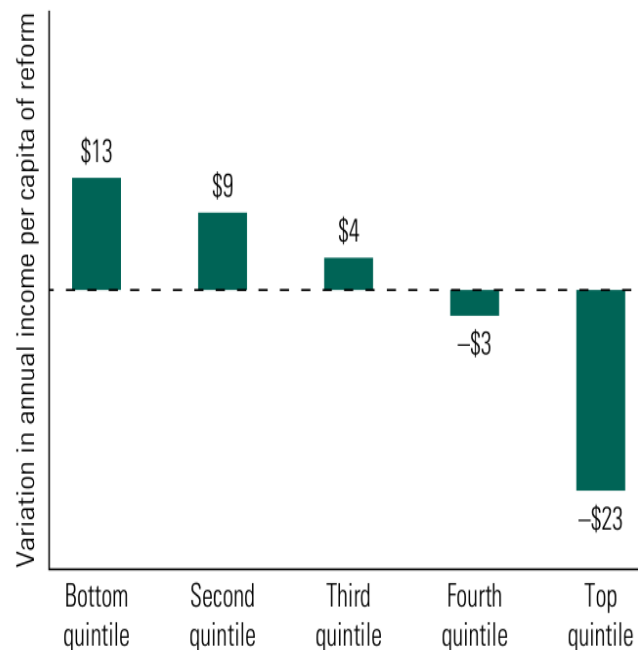


# In fact, climate policies will be successful only if they contribute to development and poverty reduction

- Climate policies can be designed such that poor people benefit
- Revenue-raising policies makes it possible to invest in development and poverty reduction

**FIGURE 0.5 Using Fossil Fuel Subsidy Resources for Universal Cash Transfers Benefits Poor People**

*(Impact of recycling \$100 from a fossil fuel subsidy to a universal cash transfer)*



Source: Based on Arze del Granado, Coady, and Gillingham (2012).

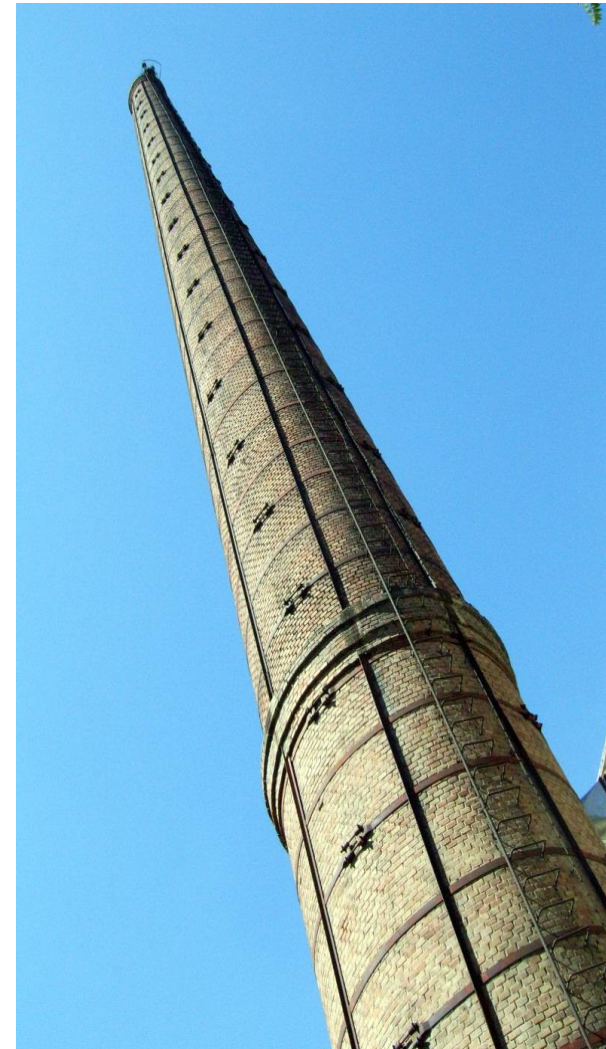
Note: The figure shows the impact of reducing the fossil-fuel subsidy budget by \$100 and distributing the savings as a universal cash transfer.



# Climate policies will be successful only if they recognize and support those who are affected

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- Make industries and regions benefit from the change
  - Automakers and electric cars
  - Oil and gas industry and carbon capture and sequestration
  - Green pilot projects in negatively affected areas
- Avoid concentrated losses and smooth the shock
  - Social protection and social safety nets
  - Dedicated adjustment mechanisms – examples of the oil shock
  - Worker retraining – examples from trade agreements



# Q&A Themes

**MEASUREMENT:** *Are current development indicators and metrics appropriate for tracking the sustainability of national development and the transition to full decarbonization?*

**DEVELOPMENT:** Will decarbonizing development be good for the poor? Do we have concrete examples?

**FINANCING:** What needs to be done to close the existing financing gap? What is needed in the short run, medium run and long run?

**TRANSPORT:** building and industry sectors have been highlighted as ripe for gains in energy efficiency and switching to renewable energy sources. Do you have examples of how these sectors are moving towards decarbonization?



*Thank you for attending this GGKP webinar on Decarbonizing Development: Three Steps to a Zero-Carbon Future.*

- This webinar was recorded and will be uploaded to the GGKP website: [www.greengrowthknowledge.org](http://www.greengrowthknowledge.org)
- If you have any further questions about the webinar please email: [contact@ggkp.org](mailto:contact@ggkp.org)