Environmental Reform of Energy Prices in Developing Countries

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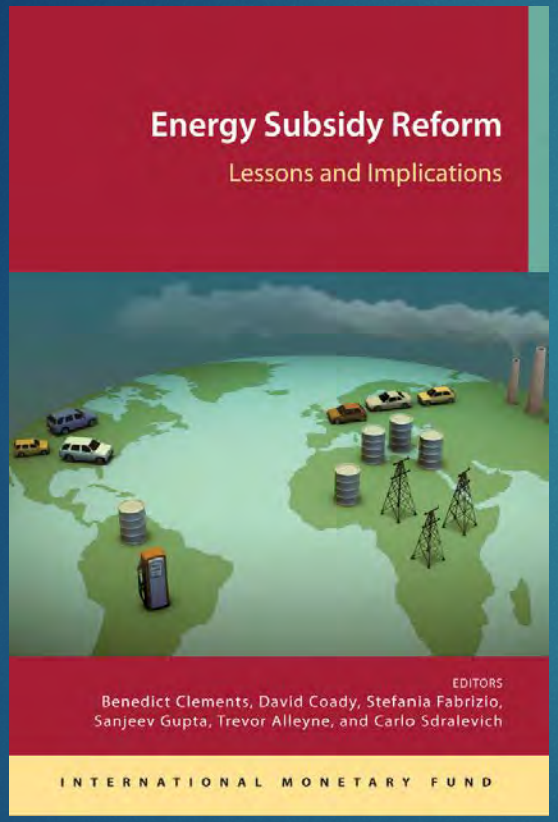
*The views expressed in this presentation are the authors' and do not reflect those of the International Monetary Fund, its Executive Committee, or its Board.

Why tax energy products?

- Correct for negative externalities
  - Environment: CO_2, local air pollution
  - Non-pollution externalities from motor vehicles: congestion, accidents, road damage
- Raise revenue to finance public expenditures or reduce other taxes
  - Developing countries especially need revenue (large informal sectors)
  - But developed countries have heavy, distortive labor and capital tax burdens that could be alleviated with more efficient environmental taxes

Efficient energy pricing reform comprises two steps:

1. Dismantle pre-tax energy subsidies
2. Apply appropriate corrective taxes



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Defining Energy Subsidies

- **Pretax subsidies** exist when energy consumers pay a price below the supply cost of energy
- **Tax subsidies** exist if energy taxes are too low (i.e., fail to correct fully for externalities)
- **Post-tax subsidies =** pre-tax subsidies + tax subsidies.

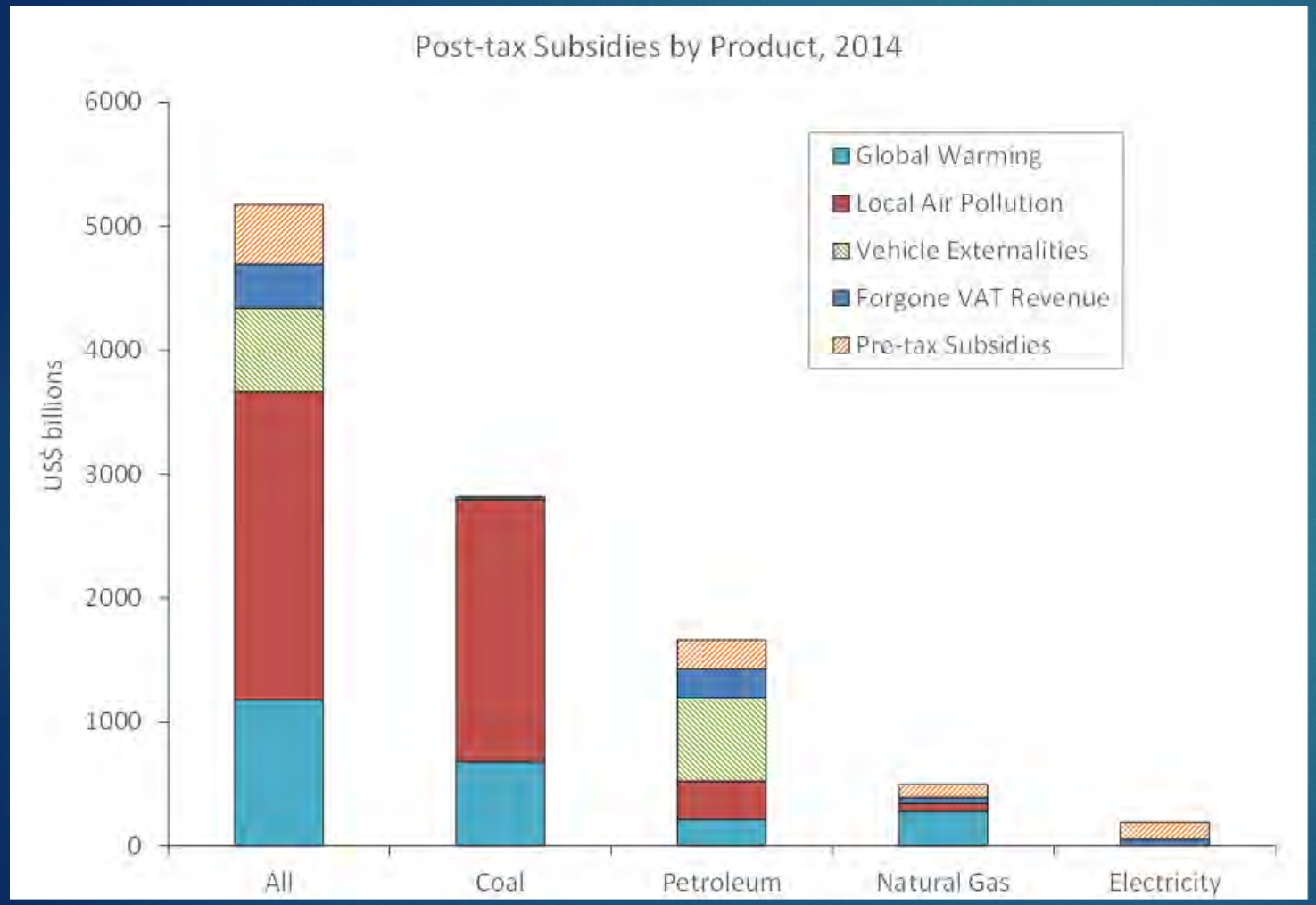
Numerous countries are dismantling pre-tax subsidies…

Country	Reform
Angola	Liberalize domestic fuel prices by 2020
Egypt	Fuel and gas prices increased 40-78%, electricity prices 20-50% in 2014
Ghana	Petroleum prices liberalized 2015
Haiti	Gasoline, diesel, kerosene prices increased 6-8% in 2014, 9-11% in 2015
India	Gasoline prices liberalized in 2010 and diesel prices in 2014
Indonesia	Abolished gasoline subsidies and capped diesel subsidies in 2015
Jordan	Automatic pricing mechanism in 2012, fuel subsidies zero in 2014
Kuwait	Raised diesel and kerosene prices 210% in 2015 (partially reversed)
Madagascar	Eliminating fuel subsidies and implementing automatic pricing in 2016
Malaysia	Prices for gasoline and diesel set monthly to reflect international prices
Mexico	Domestic fuel prices to be liberalized in 2018
Morocco	Gasoline, diesel, industrial fuel oil and LPG subsidies eliminated
Saudi Arabia	Gasoline price increased 50% in 2015, planned increases for diesel, gas, electricity
Sudan	Plan to eliminate fuel subsidies by 2019 (but fuel price riots in 2013)
UAE	Fuel price mechanism in 2015 and gasoline/diesel prices increased 25-30%
Yemen	Gasoline, diesel, kerosene prices increased 20, 50, 100% respectively in 2014

Source. IMF (2016).

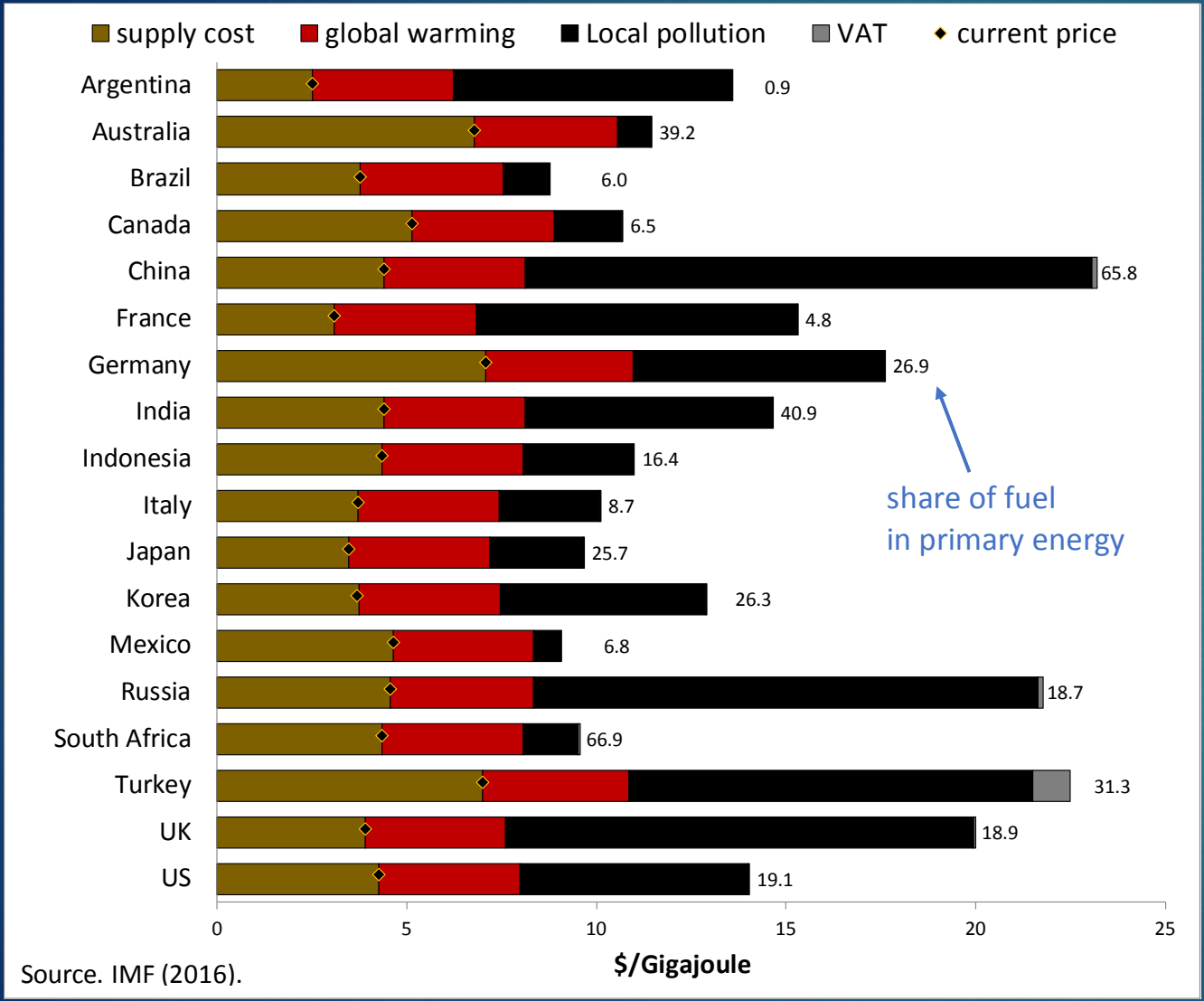
…but greater use of environmental taxes is needed

Thanks to expenditure reforms, energy subsidies now small relative to untaxed externalities



- Largest energy externality is local air pollution from coal
- Local externalities from air pollution and vehicles are larger than global externalities (GHGs)
- This helps internalize the cost of reducing GHG emissions.

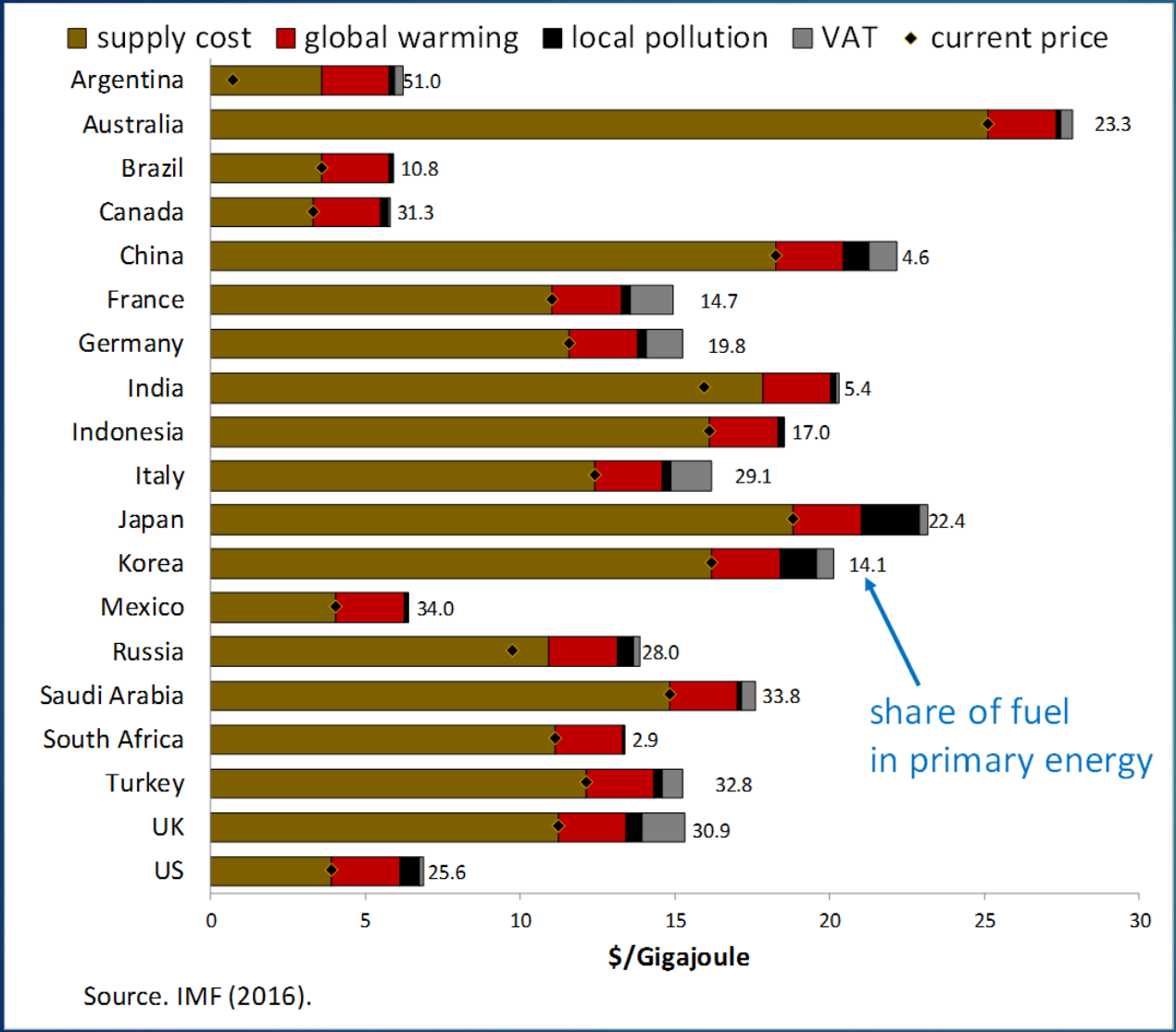
Efficient Coal Prices, 2013



Source. IMF (2016).

- Undercharging for coal use pervasive:
  - Prices cover supply cost only
  - Environmental costs are large
- Ratio of local to global externalities varies widely, as does share of energy use

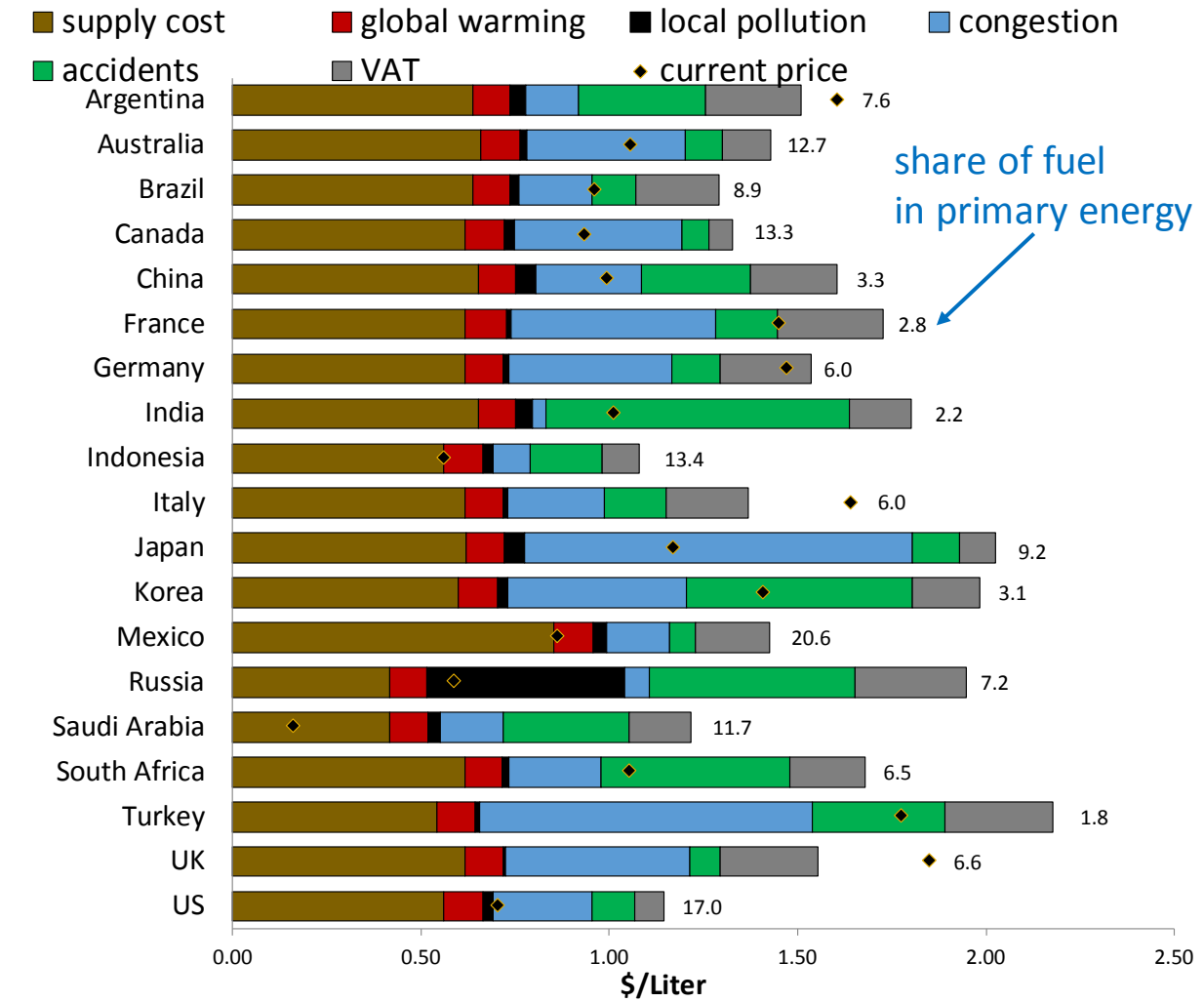
Efficient Natural Gas Prices, 2013



Source. IMF (2016).

- Natural gas is also usually untaxed, and sometimes subsidized
- Local pollution costs tend to be small relative to GHG emissions

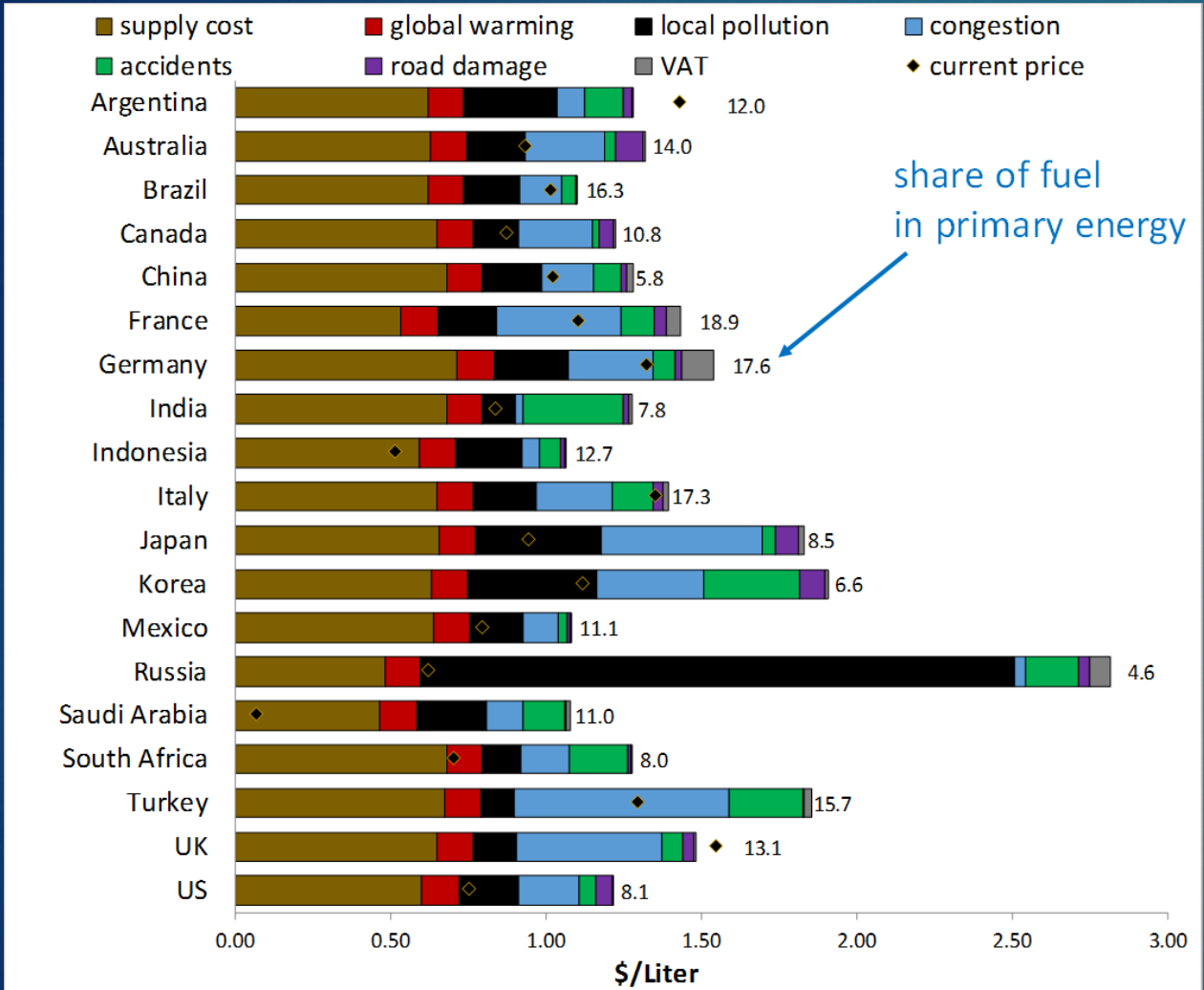
Efficient Gasoline Prices, 2013



Source. IMF (2016).

- Vehicle fuels are an important tax base in most countries
- However, most tax regimes do not fully internalize their externalities
- Local externalities, which are mostly non-environmental, far exceed global
- Non-fuel based taxes are better instruments for non-environmental externalities

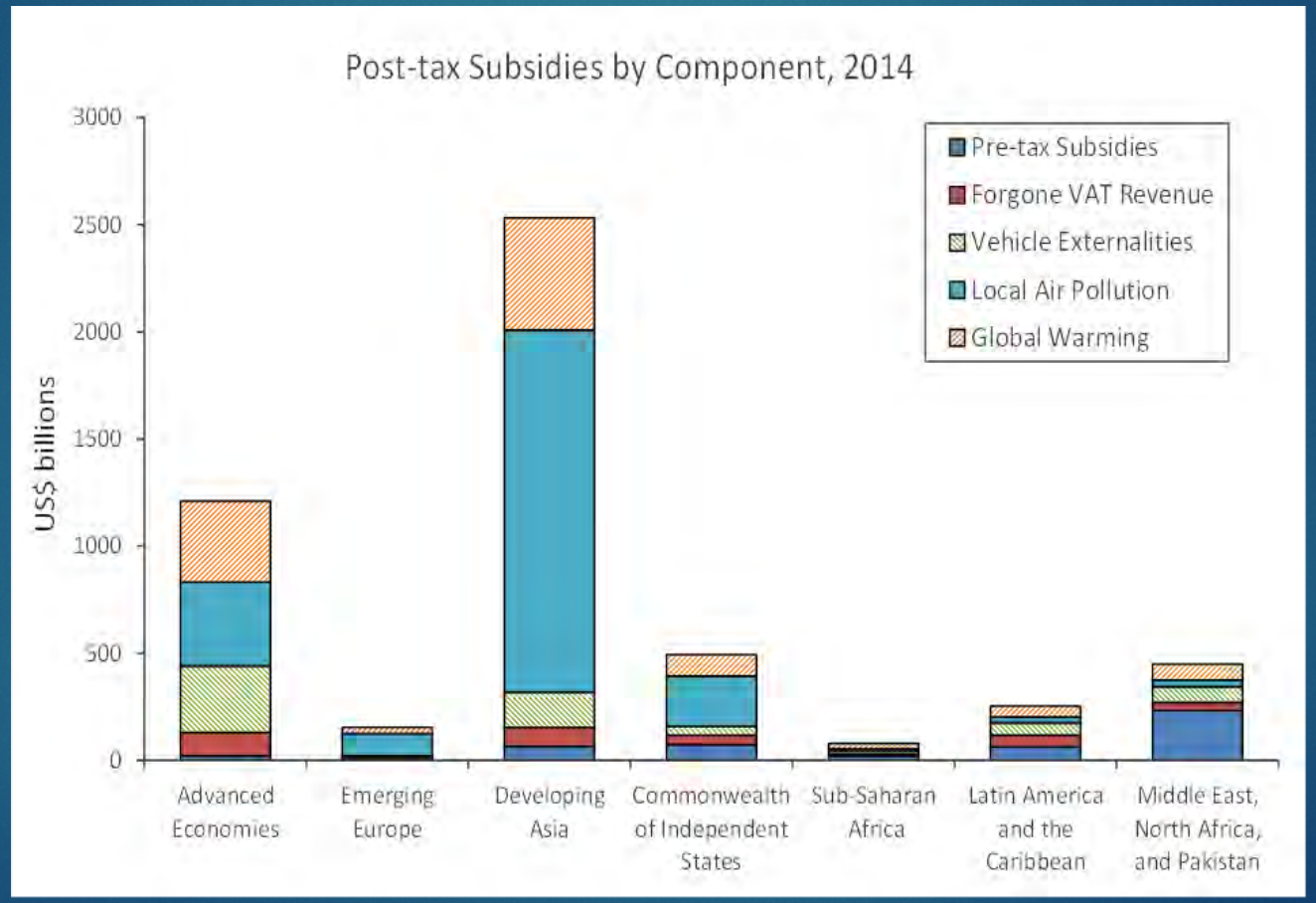
Efficient Road Diesel Prices, 2013



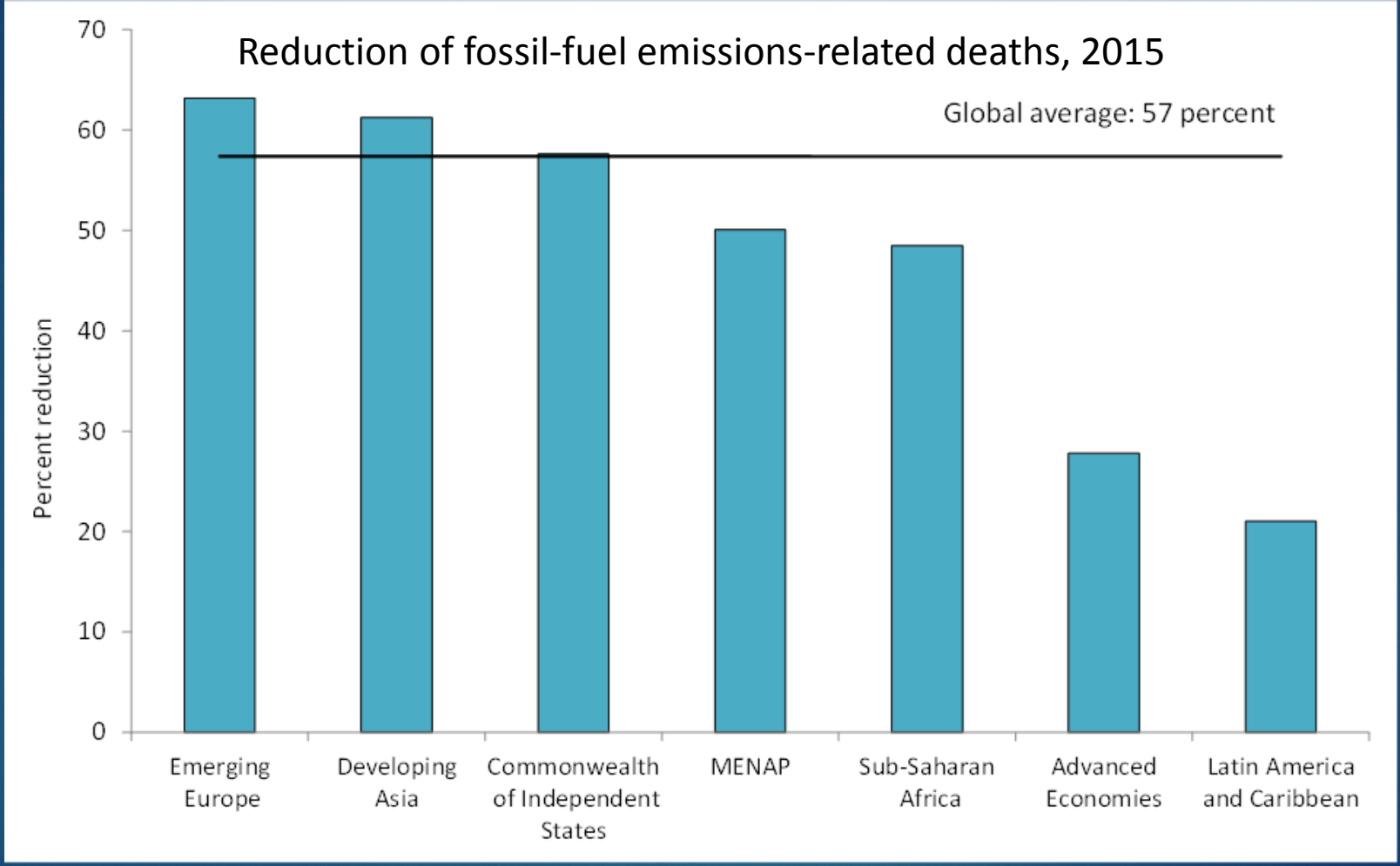
Source. IMF (2016).

- Like gasoline, diesel's local externalities generally far exceed global
- Pollution a much larger share of local diesel externalities than for gasoline
- Diesel subsidies still more common than for gasoline

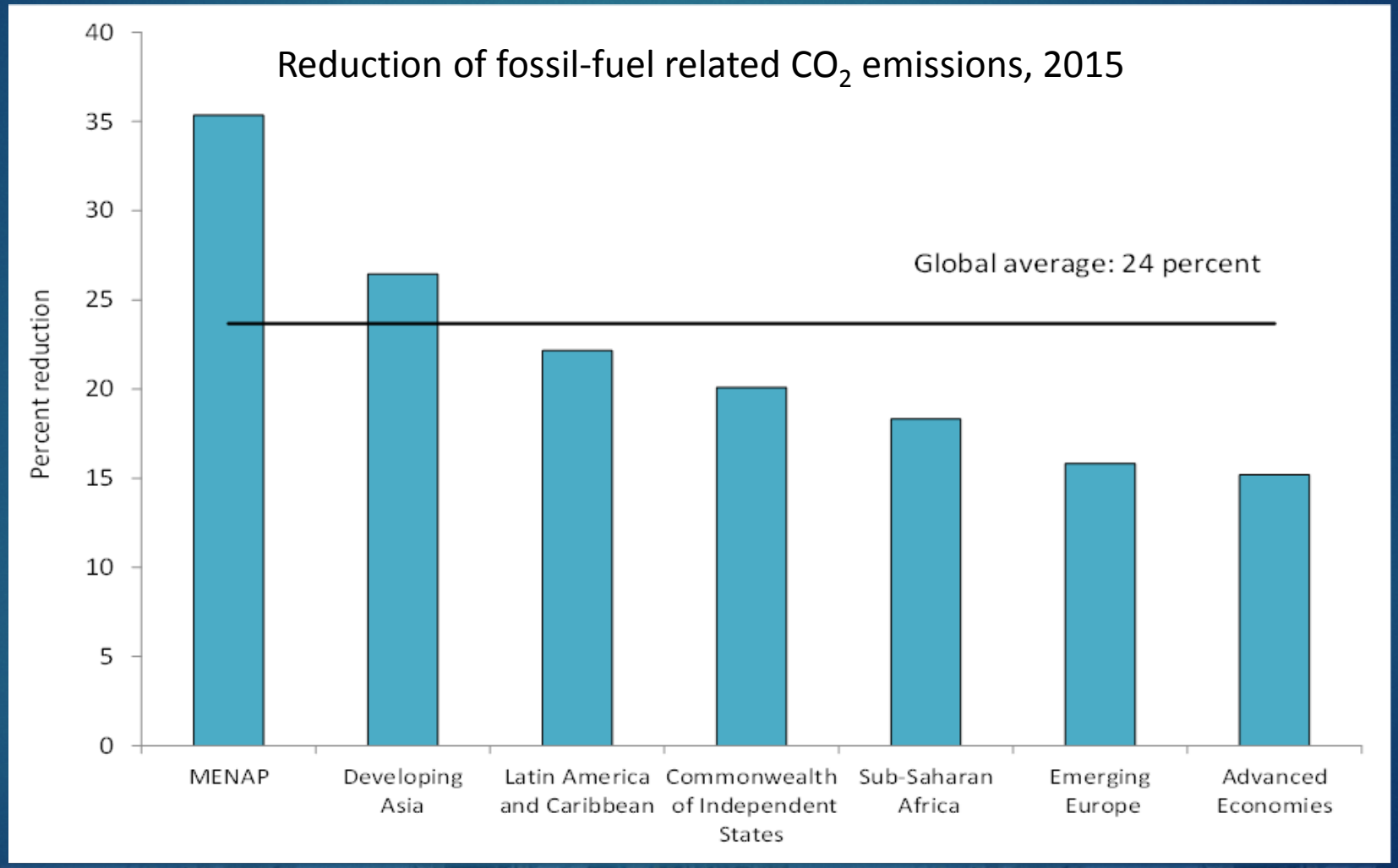
Developing Asia is greatest source of energy externalities, followed by advanced economies



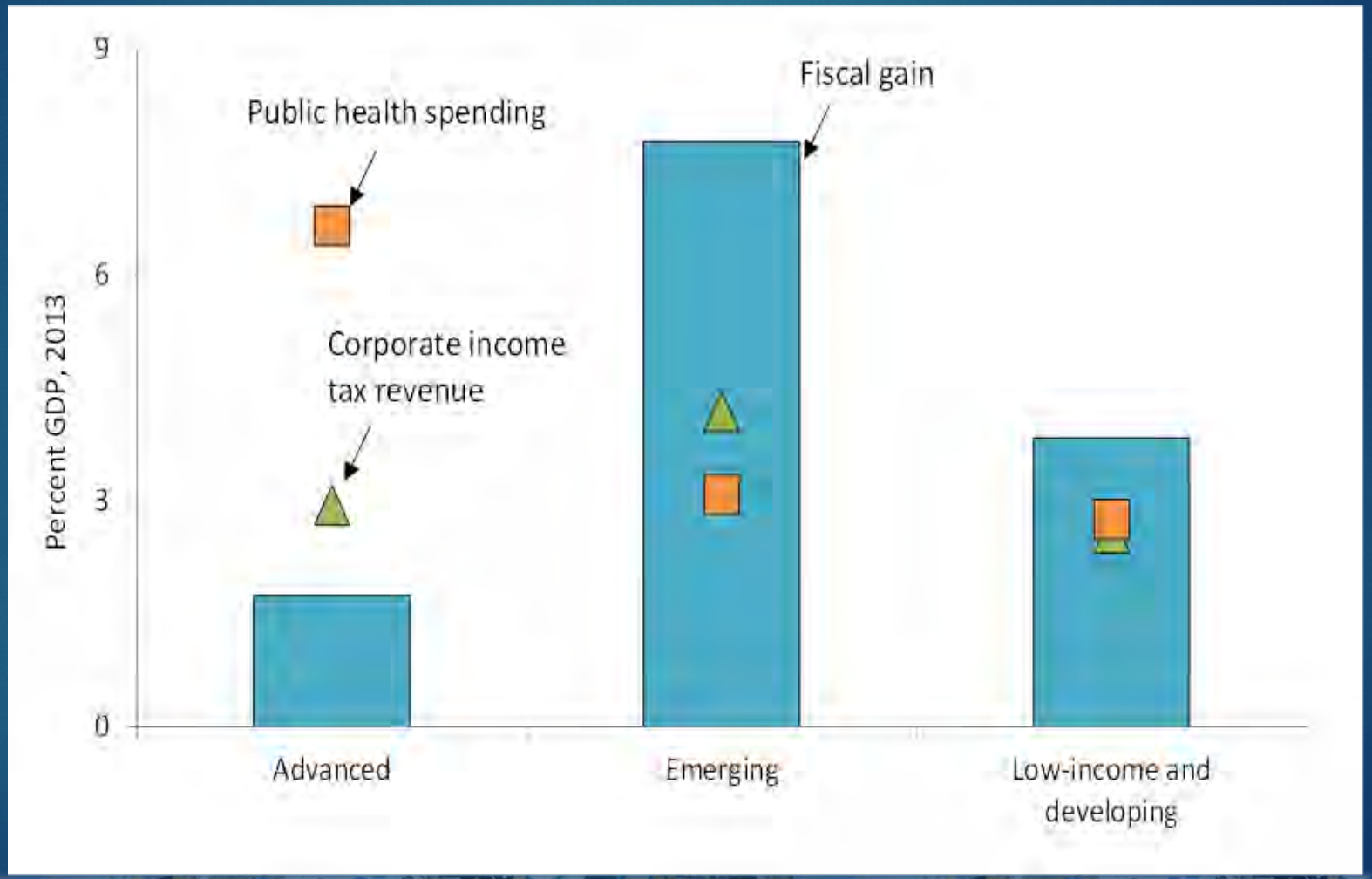
Efficient energy pricing would yield substantial health benefits…



…and reduce CO2 emissions by an average of 24 percent



The revenues from efficient fuel pricing are significant – particularly for emerging and developing countries



Carbon Pricing

Carbon is being Priced…

Government	year introduced	Price 2015, US$/ton CO2	Coverage, % of GHGs	Government	year introduced	Price 2015, US$/ton CO2	Coverage, % of GHGs
CARBON TAXES				Norway	1991	52	50
Br. Columbia	2008	23	70	Portugal	2015	7	25
Chile	2014	5	42	Sweden	1991	131	42
Japan	2012	3	66	UK	2013	24	25
Mexico	2014	1-4	46	TRADING SYSTEMS			
South Africa	2016	10	80	Alberta	2007	15	45
Switzerland	2008	86	33	California	2012	13	85
In the EU ETS				EU	2005	5	45
Denmark	1992	26	45	Kazakhstan	2013	2	50
Finland	1990	60-65	15	Korea	2015	15	68
France	2014	25	35	N. Zealand	2008	13	52
Iceland	2010	10	50	Quebec	2013	13	85
Ireland	2010	22	40	RGGI	2009	5	21

Source. WBG (2014, 2016).

…but coverage and prices are below what is needed

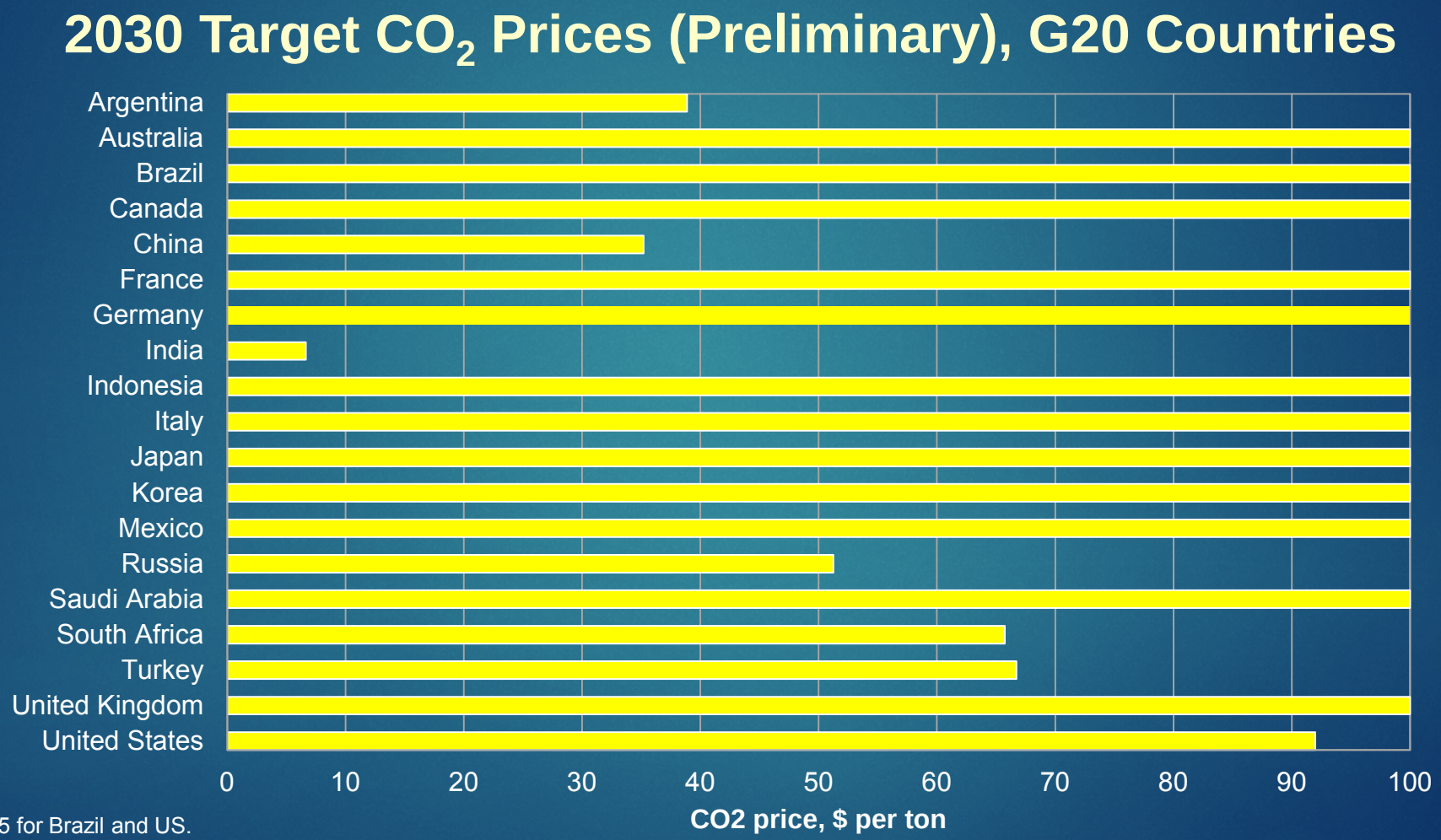
197 Countries Made Mitigation Pledges in Paris 2015

Country	Mitigation pledge: Reduce…	Implied CO_2 reduction below business as usual in 2030 or thereabouts, %
Argentina	GHGs 15% below BAU in 2030	15
Australia	GHGs 26-28% below 2005 by 2030	52
Brazil	GHGs 37% below 2005 by 2025	63
Canada	GHGs 30% below 2005 by 2030	40
China	CO_2/GDP 60-65% below 2005 by 2030	28
France	GHGs 40% below 1990 by 2030	48
Germany	GHGs 40% below 1990 by 2030	40
India	GHG/GDP 33-35% below 2005 by 2030	10
Indonesia	GHGs 29% below BAU in 2030	29
Italy	GHGs 40% below 1990 by 2030	43
Japan	GHGs 25% below 2005 by 2030	33
Korea	GHGs 37% below BAU in 2030	37
Mexico	GHGs 25% below BAU in 2030	25
Russia	GHGs 25-30% below 1990 by 2030	19
S. Arabia	GHGs 130 million tons below BAU by 2030	25
S. Africa	GHGs 398-614 million tons in 2025 and 2030	32
Turkey	GHGs up to 21% below BAU by 2030	21
UK	GHGs 40% below 1990 by 2030	48
US	GHGs 26-28% below 2005 by 2025	32

Source. UNFCCC and IMF staff calculations.

- Typical pledge of G20 countries is around 30% reduction in GHG emissions by 2030
  - China may revise its target upward
- Some developing country commitments are much lower, however

Most G-20 countries will need to impose substantial emissions prices to meet Paris commitments



Source: IMF (2016). Note: 2025 for Brazil and US.

Choice of mitigation instrument is key to success:

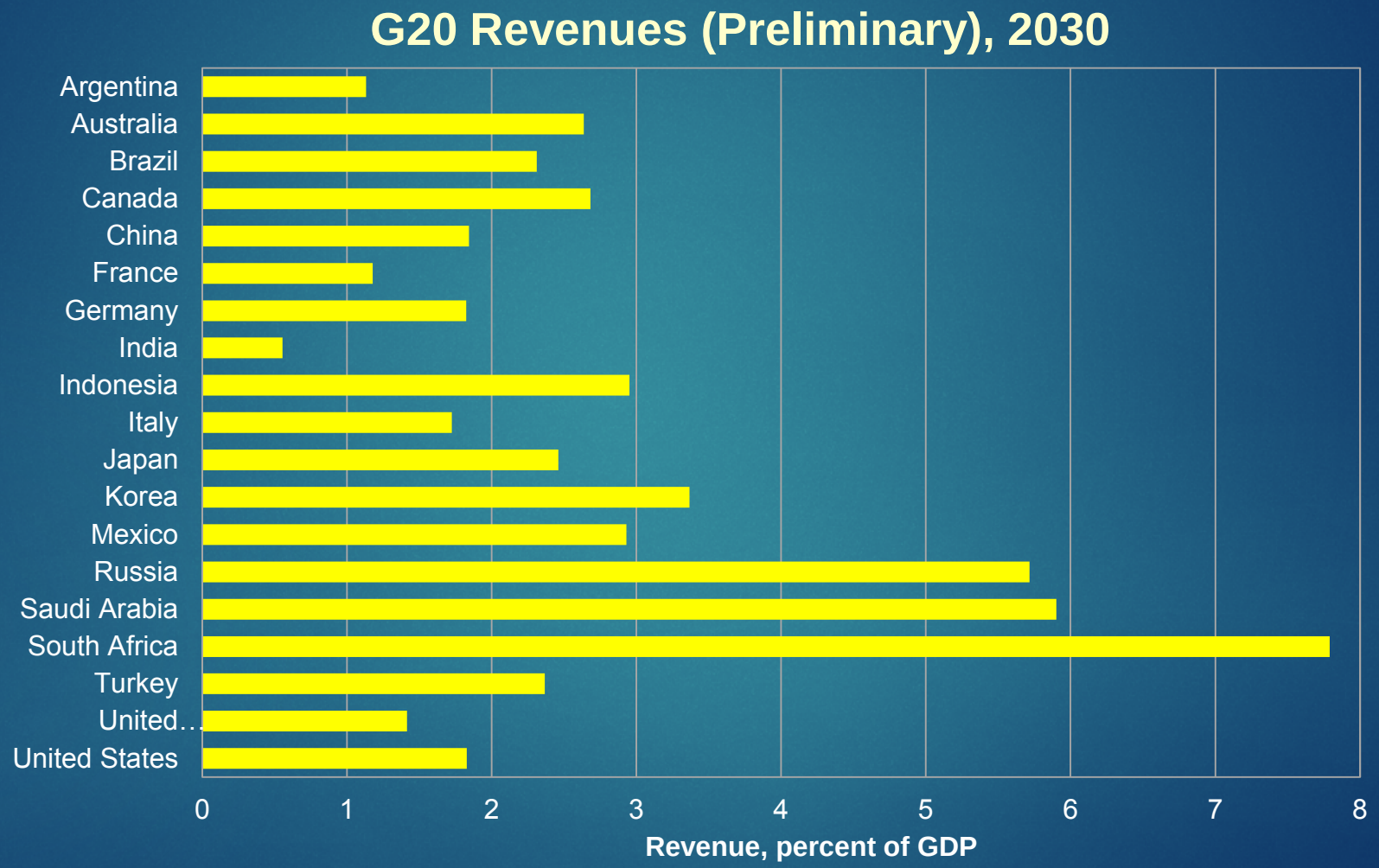
- **Carbon pricing** has key advantages over other options (e.g., energy efficiency or renewables requirements)
  - Environmentally effective
  - Raises revenue (providing emission rights are not given away)
  - Efficiently allocates investment (unlike project-by-project funding)

- But critical to get design details right…

Carbon Tax vs. ETS

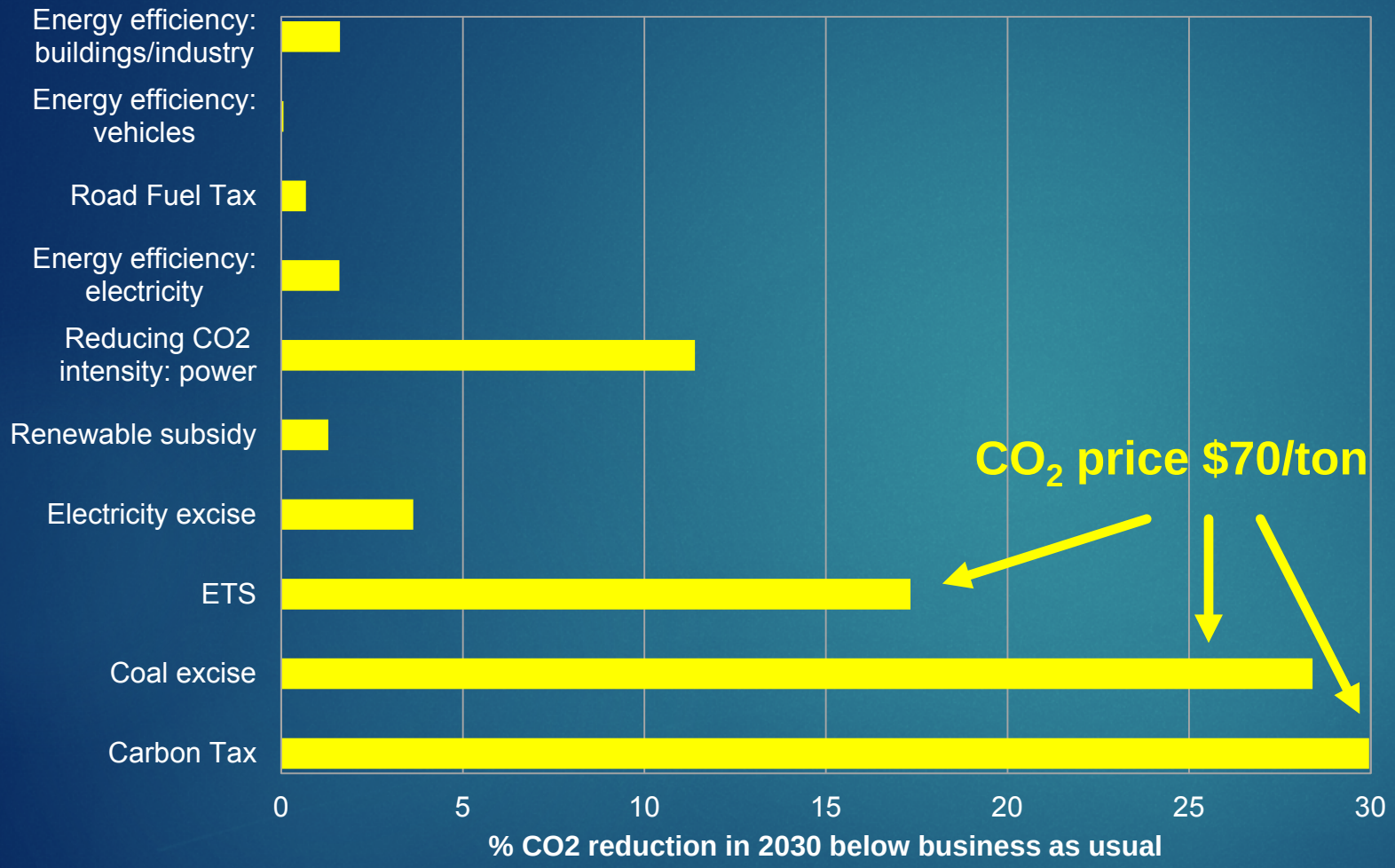
- Upstream carbon tax charges carbon content of fuel supply
  - Covers emissions from all sources
  - Straightforward extension of fuel taxes
- By contrast, emissions trading systems (ETS) are typically downstream
  - Miss ≈50% of CO_2 (e.g., vehicles, buildings)
  - Require adequate markets and institutional capacity

Carbon taxes have the capacity to raise substantial revenues



Source: IMF (2016). Note: 2025 for Brazil and US.

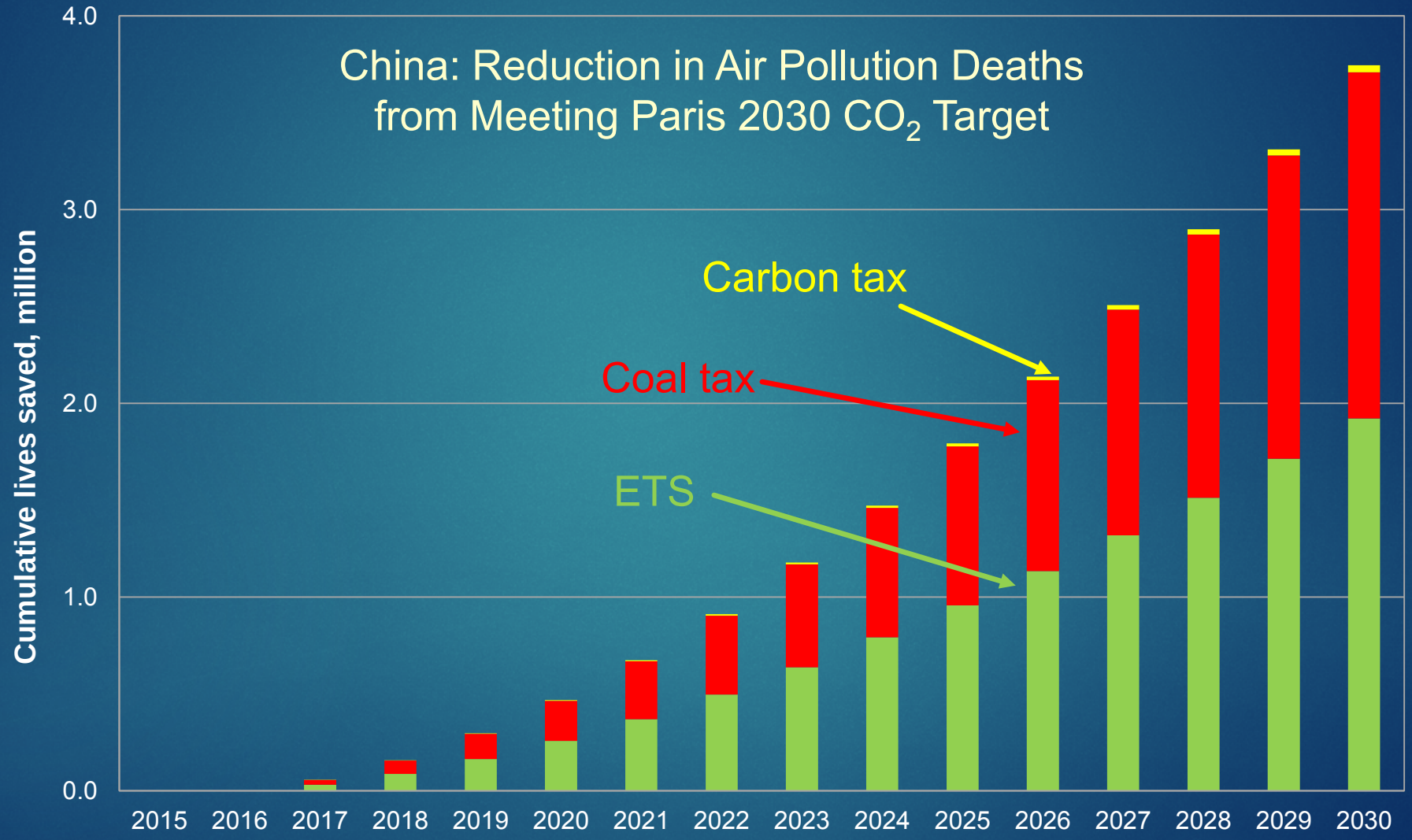
China (29% of 2013 emissions) warrants a closer look:



- CT of $70/ton by 2030 would substantially reduce emissions
- But tax on coal alone is almost as effective
- ETS about 40% less effective (excludes small users)
- Given that China is adopting ETS, recommend combining with upstream coal tax
  - Possibly with credits for downstream users

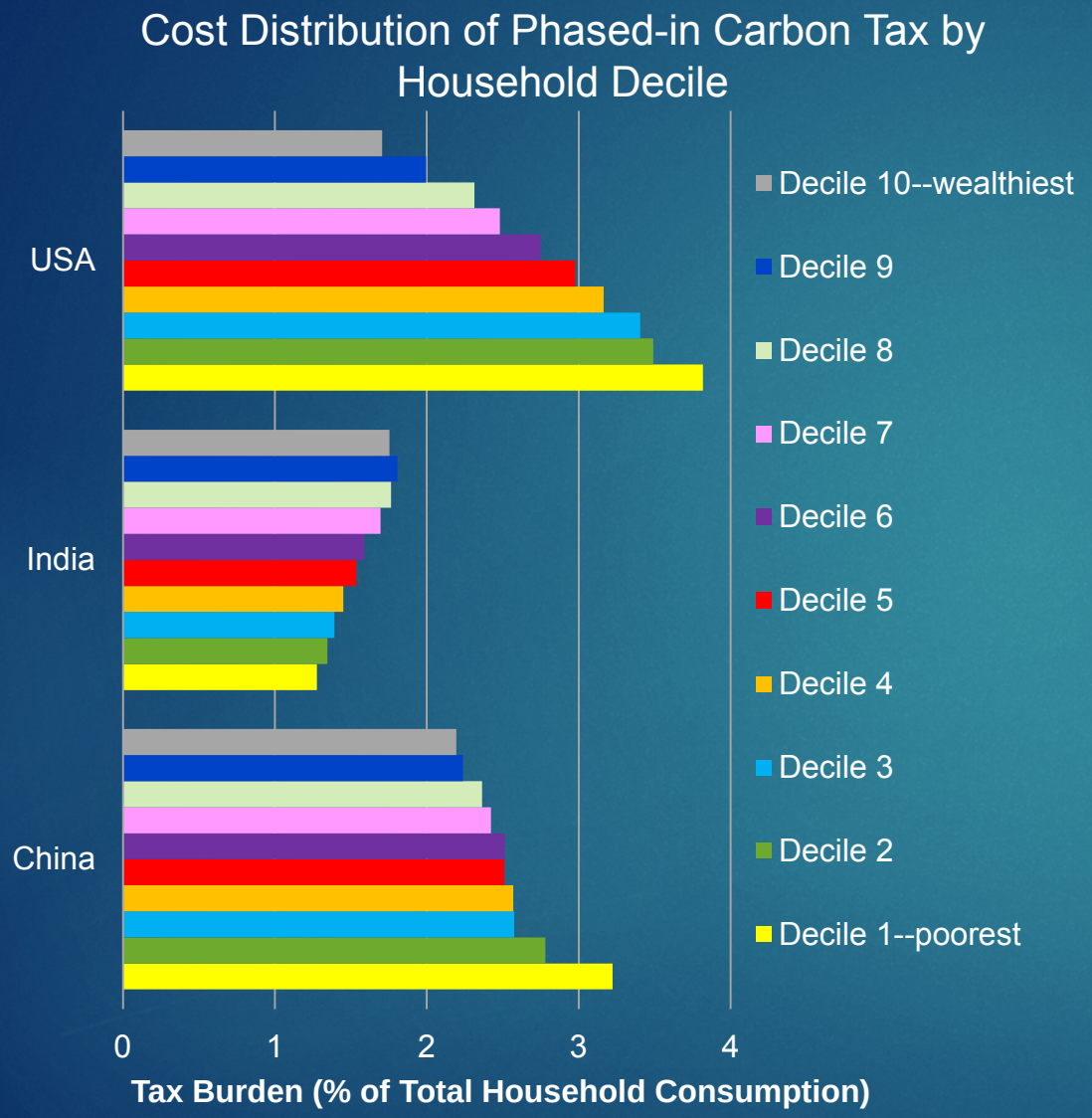
Source: IMF (2016).

CT or ETS + Coal Tax would dramatically improve health



Source: IMF (2016).

Introduction of carbon tax entails protecting vulnerable groups



- Business
  - Assist transition from uneconomic activities
- Households
  - Carbon tax can be either moderately regressive or progressive, depending on distribution of fuels use
  - Typically ≤12% of revenues needed to compensate poor households
    - For China, US and India cost is only 6%

Source: IMF (2016).

Thank You!

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