



WORLD BIOGAS  
ASSOCIATION

# Nordic Biogas Conference 2019

David Newman, President World Biogas Association

# Who is the World Biogas Association ?



- A global association for the promotion of the biogas industry
- Founded in 2016 by 4 major national associations including ADBA and 16 major biogas companies
- Collaborating with international organisations to drive the policies around climate change and SDGs and investments in biogas technologies
- Food waste, sewage, agriculture, small scale too
- Easy to join and participate, open to all

# The Climate Change Process

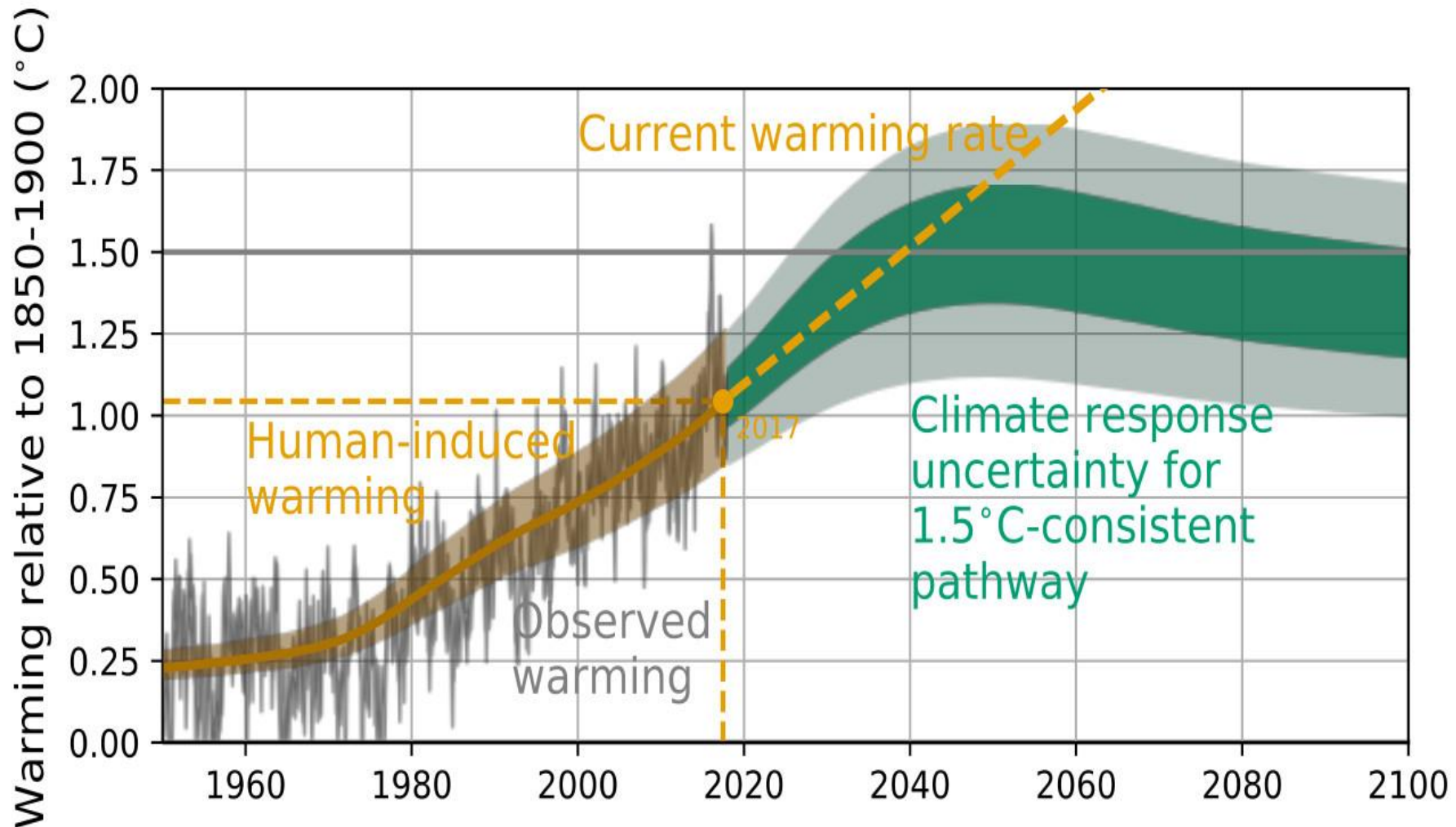
## Paris 2015 to Katowice 2019



- Process is complicated and outcomes uncertain
- Total unanimity is required for every vote
- US withdrawal disruptive
- Has strengthened Australia, Canada, Russia, Saudis, Brazil against climate change logic
- The “big deal” was money V commitments
- Missing some \$30-40 billion for 2020 commitment
- Yet the need for action is more urgent every day



# Where are we ?



Source: IPCC Special Report on Global Warming of 1.5°C, Chapter 1 – Technical Annex 1.A, Fig. 12

# Just 2 countries have implemented policies to meet the 1.5°C 2100 target



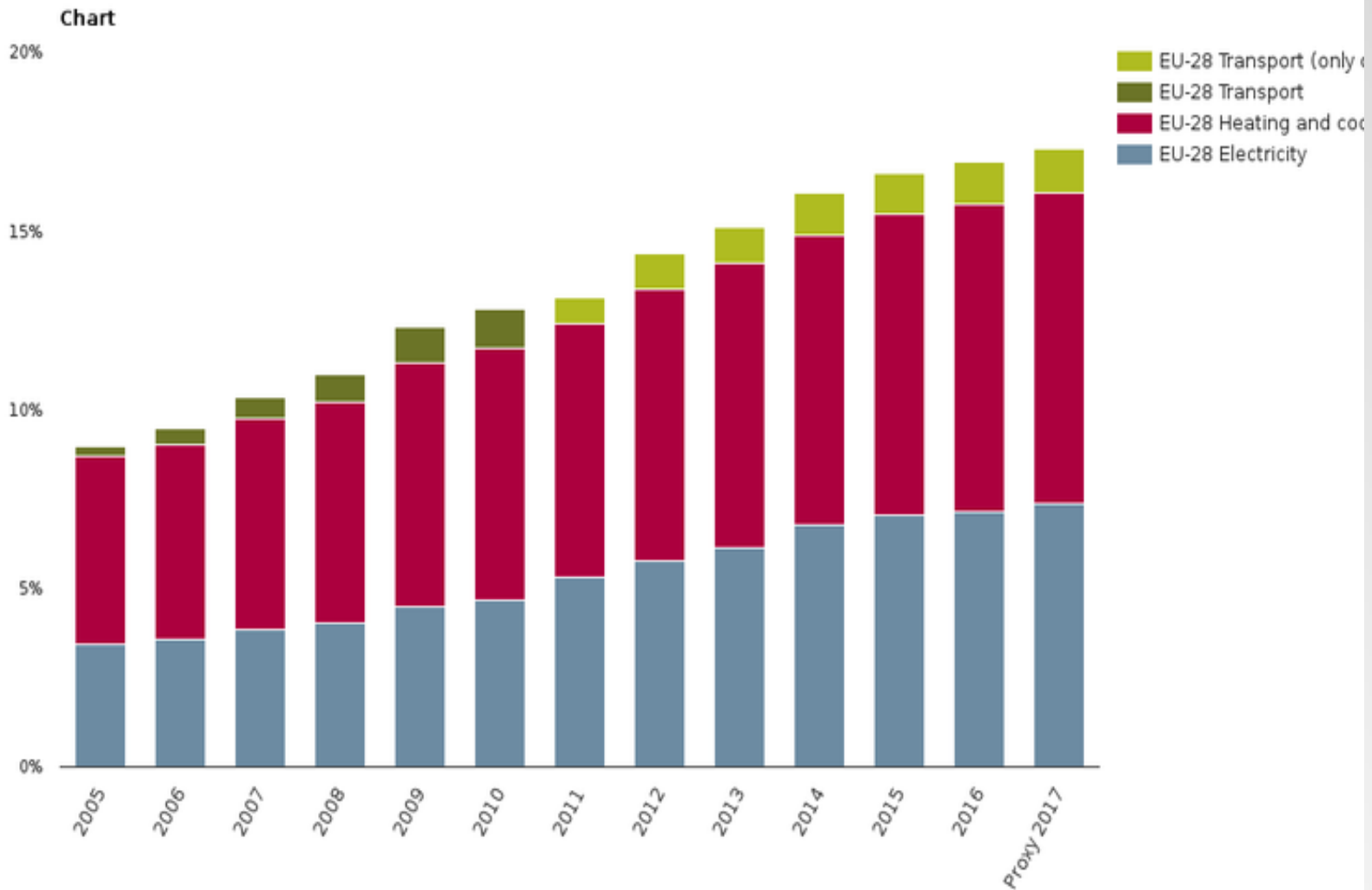
# A long way t-EU go



## Share of energy from renewable sources in the EU Member States

(2017, in % of gross final energy consumption)





Source: European Environment Agency

Overall renewable energy production is actually still less than 17% across the EU28.

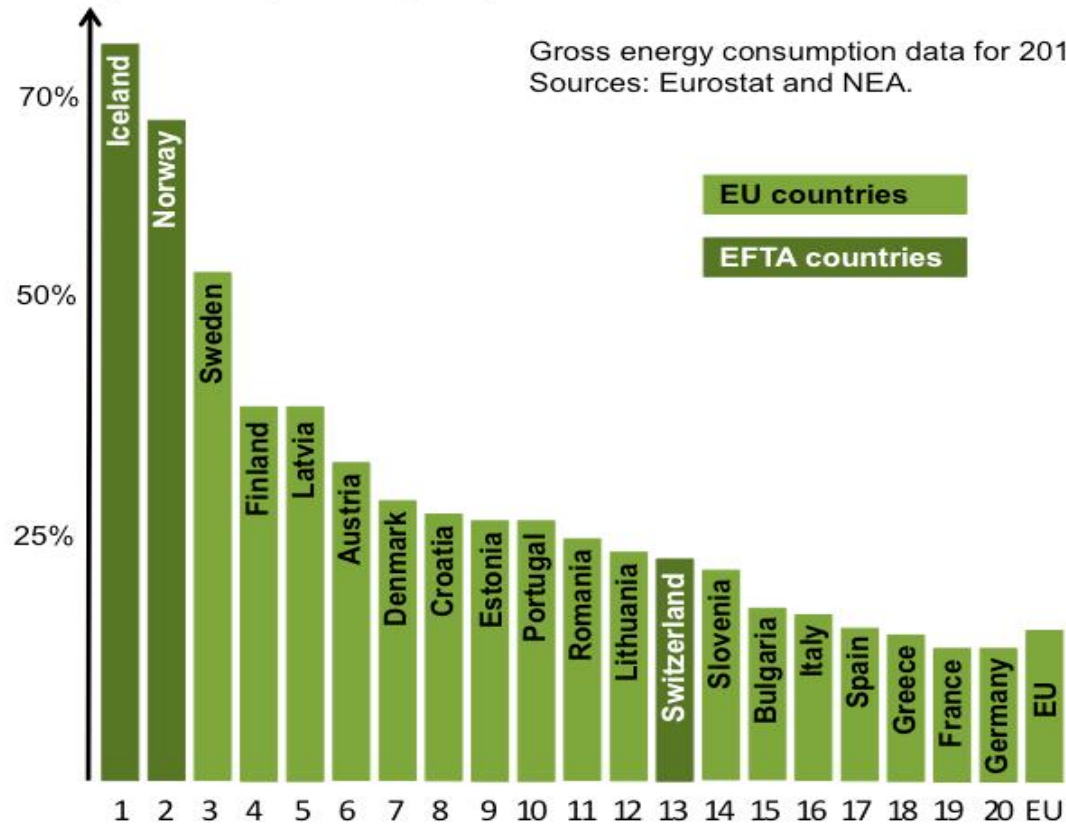
# Norway is second in Europe for renewable energy production and has 98% renewable electricity



## ICELAND IS EUROPE'S GREEN ENERGY LEADER

1.	<b>Iceland</b>	77 %
2.	Norway	69 %
3.	Sweden	53 %
4.	Finland	39 %
5.	Latvia	39 %
6.	Austria	33 %
7.	Denmark	29 %
8.	Croatia	28 %
9.	Estonia	27 %
10.	Portugal	27 %
11.	Romania	25 %
12.	Lithuania	24 %
13.	Switzerland	23 %
14.	Slovenia	22 %
15.	Bulgaria	18 %
16.	Italy	17 %
17.	Spain	16 %
18.	Greece	15 %
19.	France	14 %
20.	Germany	14 %
21.	Czech Republic	13 %
22.	Slovakia	12 %
23.	Poland	11 %
24.	Hungary	10 %
25.	Cyprus	9 %
26.	Ireland	9 %
27.	Belgium	8 %
28.	UK	7 %
29.	Holland	6 %
30.	Luxembourg	5 %
31.	Malta	5 %
	EU average	16 %

Share of renewable energy (percentage) in gross final energy consumption. Graph shows top-20 European green countries within EU and EFTA.

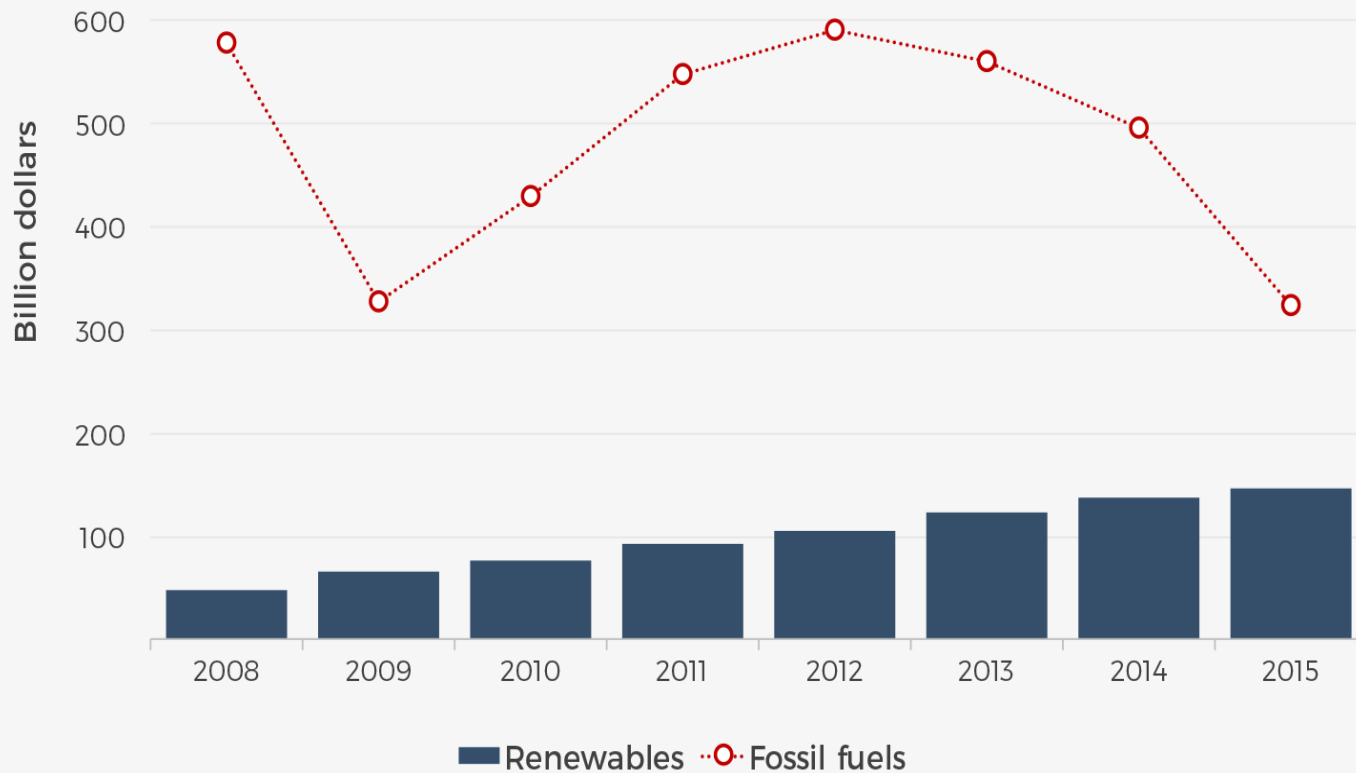




# Incentives to renewables have helped develop the industry but are still less than half of fossil fuel subsidies



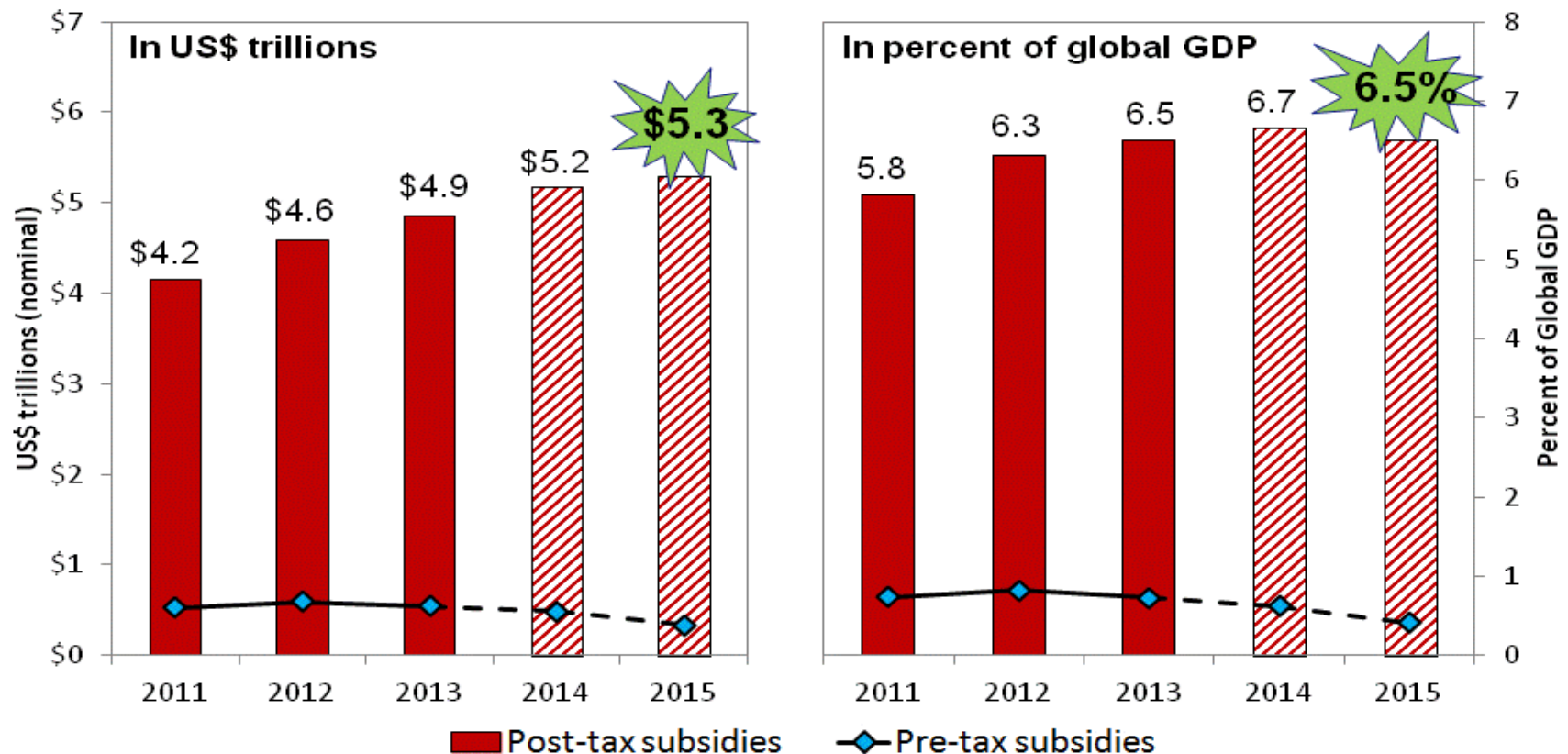
## Global subsidies for fossil-fuel consumption and renewables World Energy Outlook 2016



# Yet subsidies and incentives are still climate negative !

## Global energy subsidies are \$5.3 trillion

Global energy subsidies



Pre-tax consumer subsidies arise when the price paid by consumers is below the cost of supplying energy. Post-tax consumer subsidies arise when the price paid by consumers is below the supply cost of energy plus an appropriate "Pigouvian" (or "corrective") tax reflecting the environmental damage associated with energy consumption and an additional consumption tax that should be applied to all consumption goods for raising revenues.



“Global energy subsidies increased from US\$4.2 trillion in 2011 to US\$5.3 trillion in 2015. In percent of GDP, global energy subsidies increased from 5.8 percent of global GDP in 2011 to 6.5 percent in 2015.

They exceed global public health spending, estimated by the World Health Organization at US\$4.3 trillion in 2013.

**It is one of the largest negative externalities ever estimated.”**

(source, IMF)

# The cost of fossil energy subsidies...



## Costs are far-reaching .....



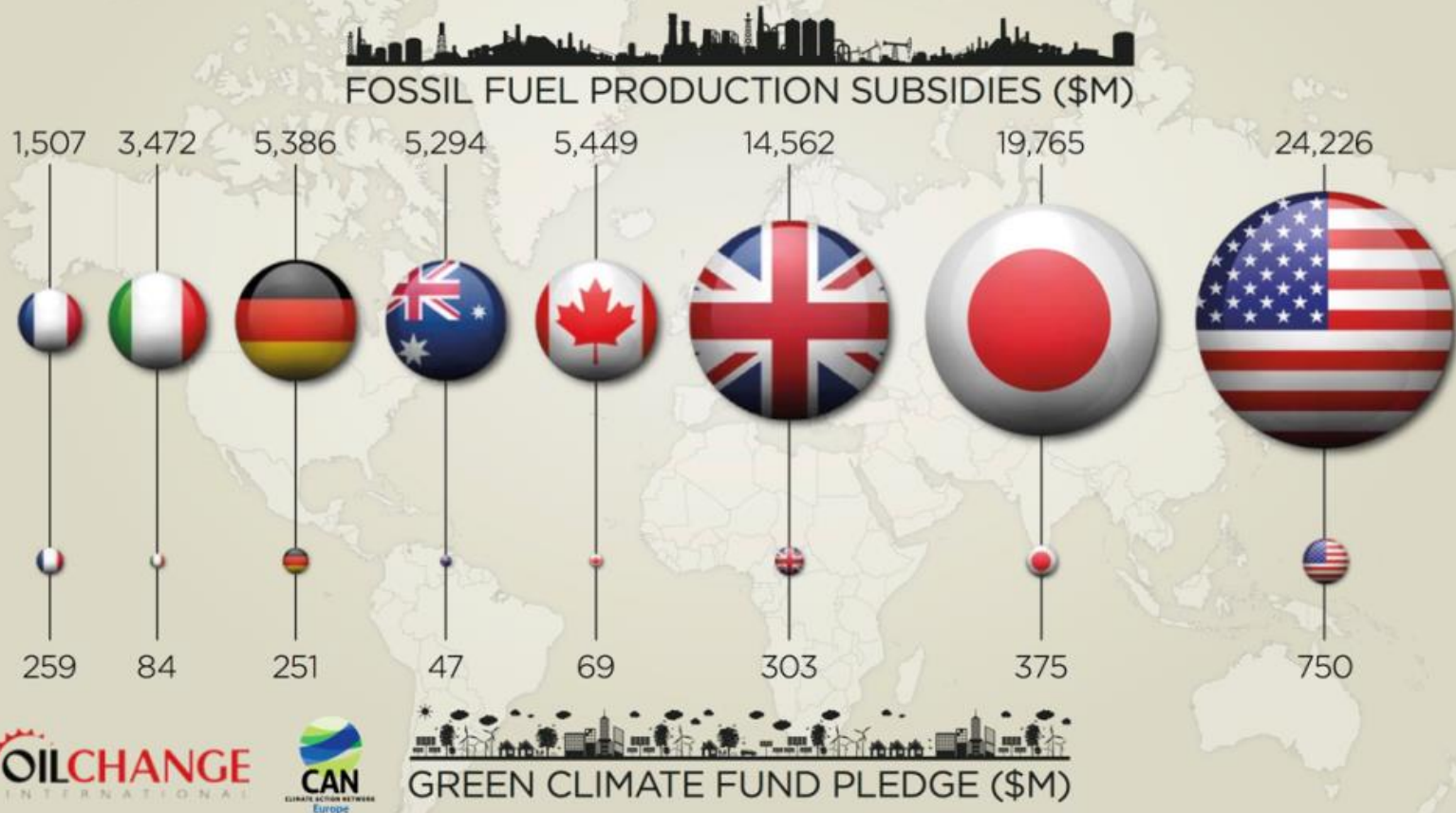
- **Exacerbate environmental damage**
  - Local pollution, traffic congestion and accidents, road damage, and global warming
- **Worsen inequality**
  - Most of the benefits are captured by rich households
  - Better targeted policy instruments are often available or can be quickly developed
- **Retard economic growth**
  - Discourage energy investments and encourages energy inefficiency
- **Fiscally costly**
  - Which requires higher distortionary taxation and crowds out high priority spending (education, health, infrastructure)



# We are almost all guilty of paying lip service to climate change.

## START FUNDING CLIMATE ACTION, STOP FUNDING CLIMATE CHAOS

Climate finance for developing countries is a major sticking point in the UNFCCC negotiations. Pledges to the Green Climate Fund – a key channel for climate finance – currently stand at only \$10 billion over several years. Every year, governments spend hundreds of billions of dollars to support oil, gas and coal production, fueling climate chaos. G7 countries plus Australia spend \$80 billion annually to support fossil fuel production, compared to just \$2 billion in annual support to the Green Climate Fund.



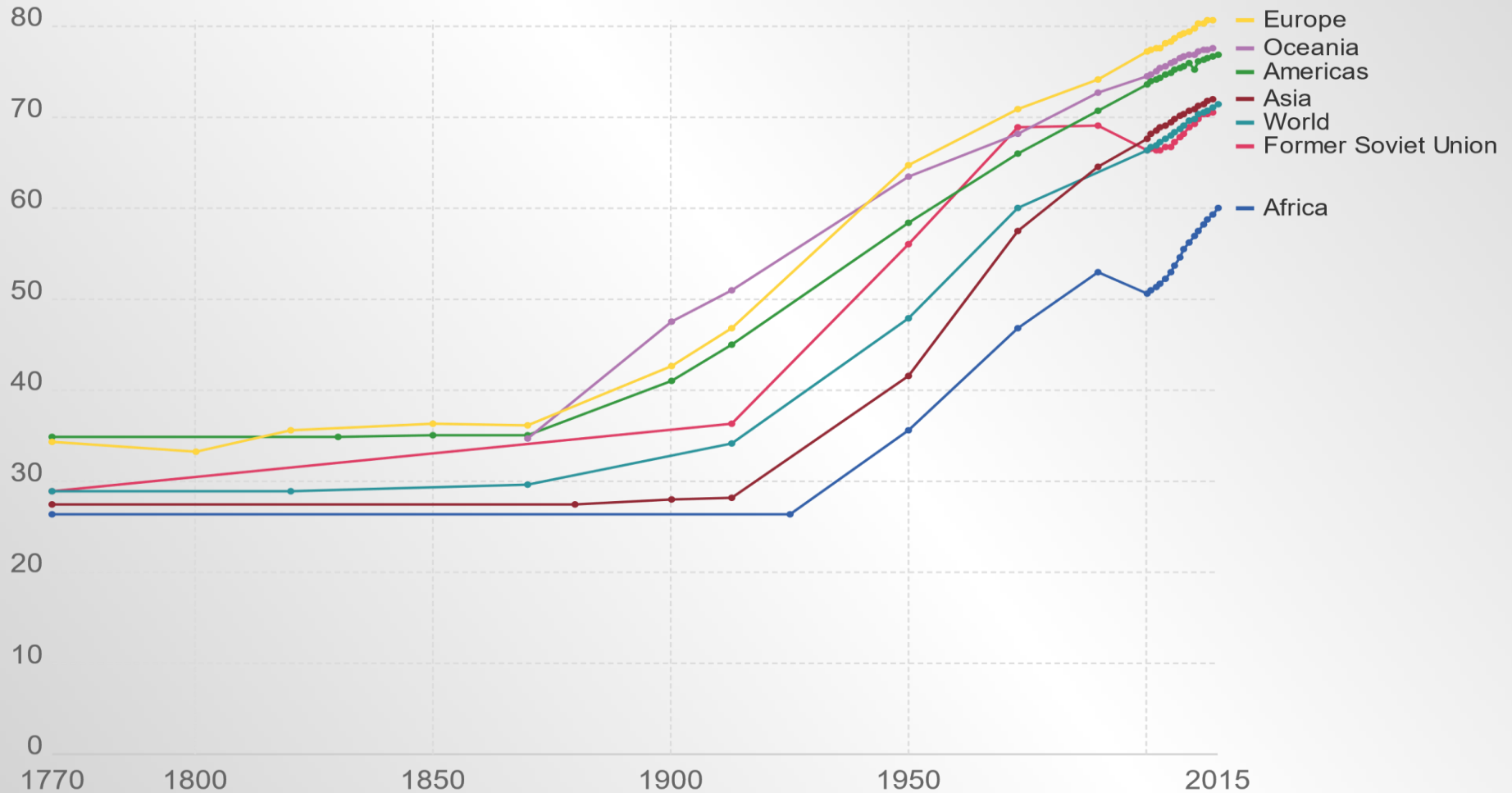
But it is not all bad news.....

*We should not despair, let's be optimistic, if we despair all is lost....*

# Humans have shown we are capable of miracles



## Life expectancy globally and by world regions since 1770



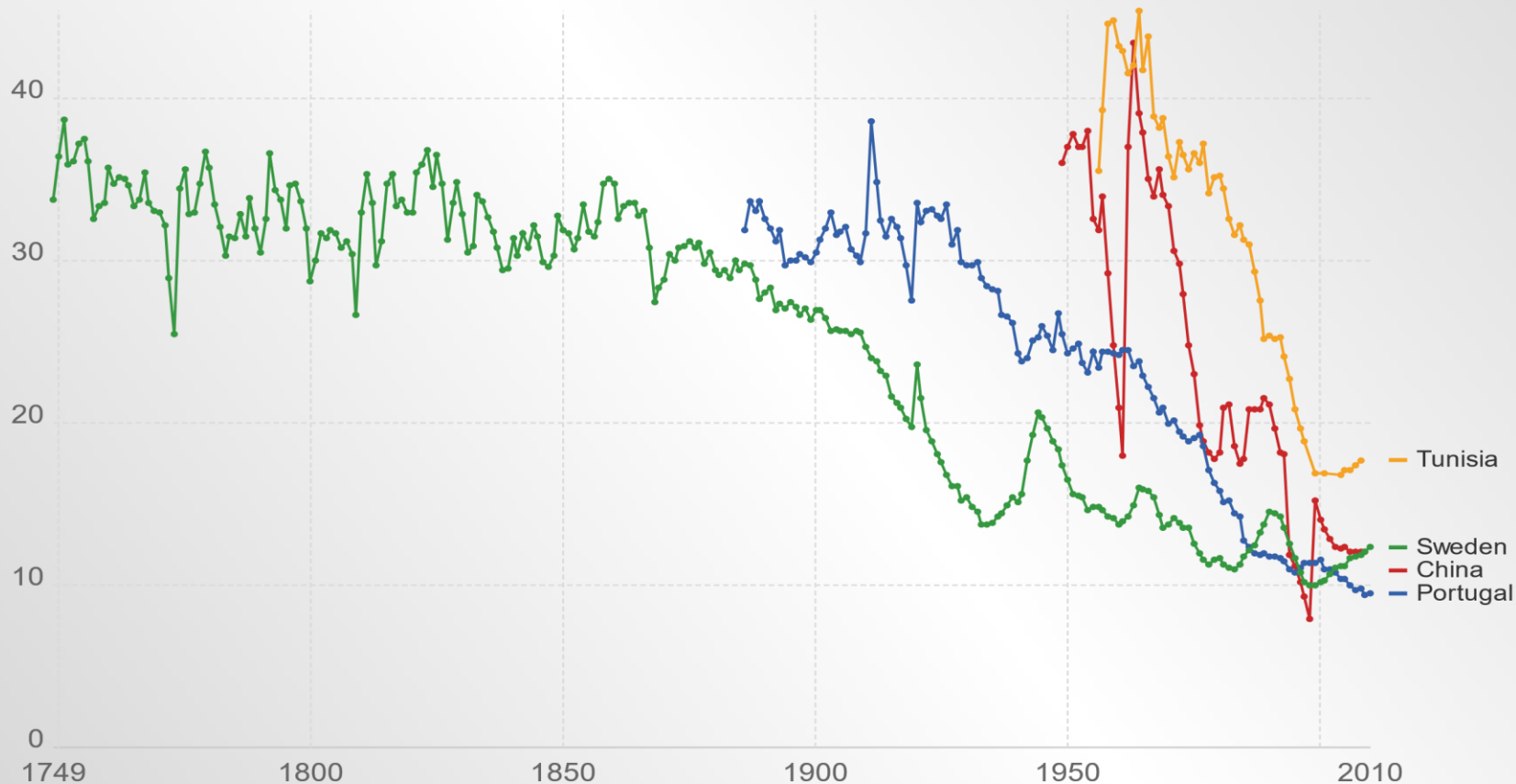
Source: Life expectancy – James Riley for data 1990 and earlier; WHO and World Bank for later data (by Max Roser)  
OurWorldInData.org/life-expectancy/ • CC BY-SA

# Birth rate falling rapidly



Birth Rate: The number of births per 1,000 people in the population

Our World  
in Data



Source: International Historical Statistics (Births per 1,000) - Brian Mitchell (2013)

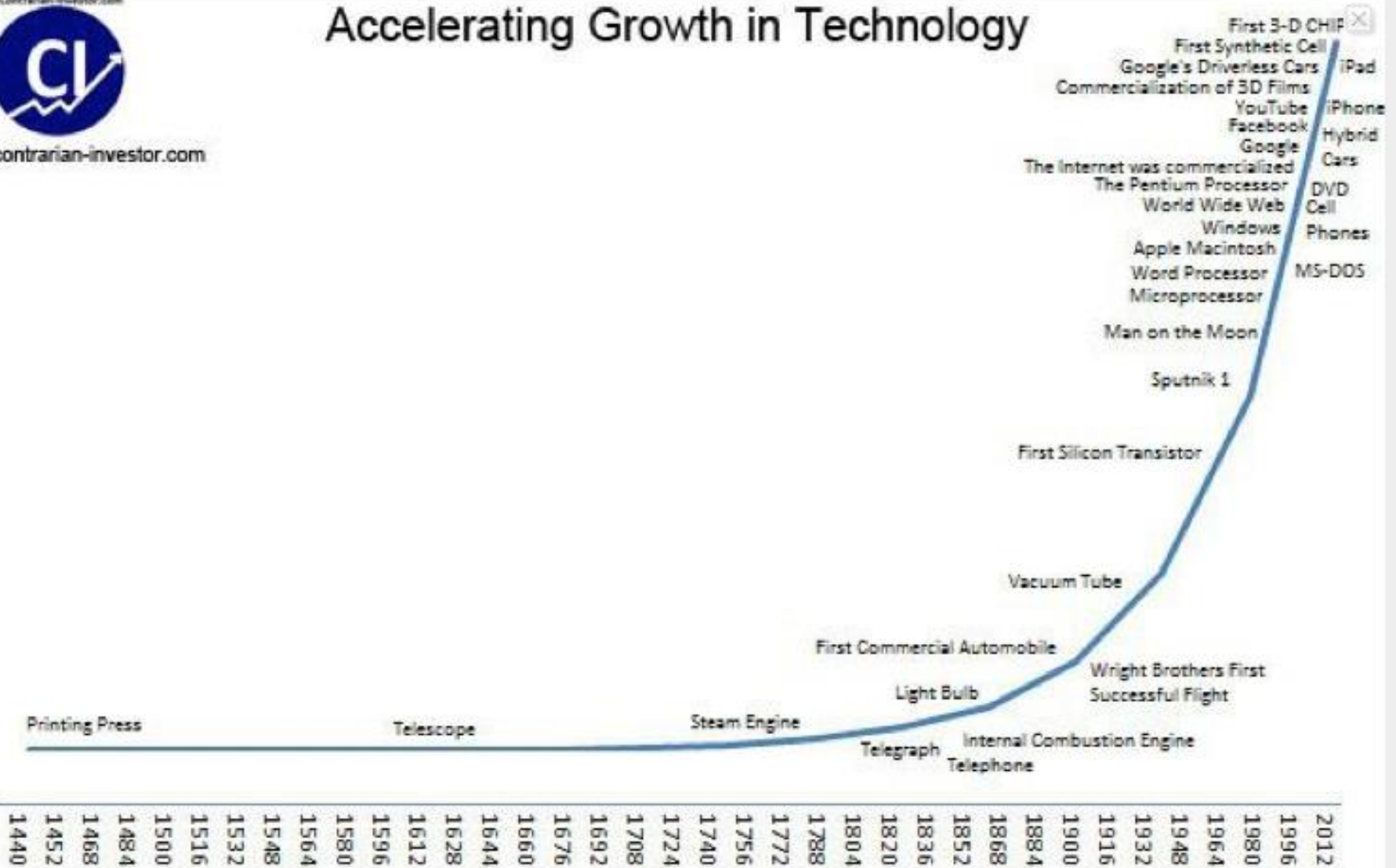
OurWorldInData.org/fertility-rate • CC BY-SA



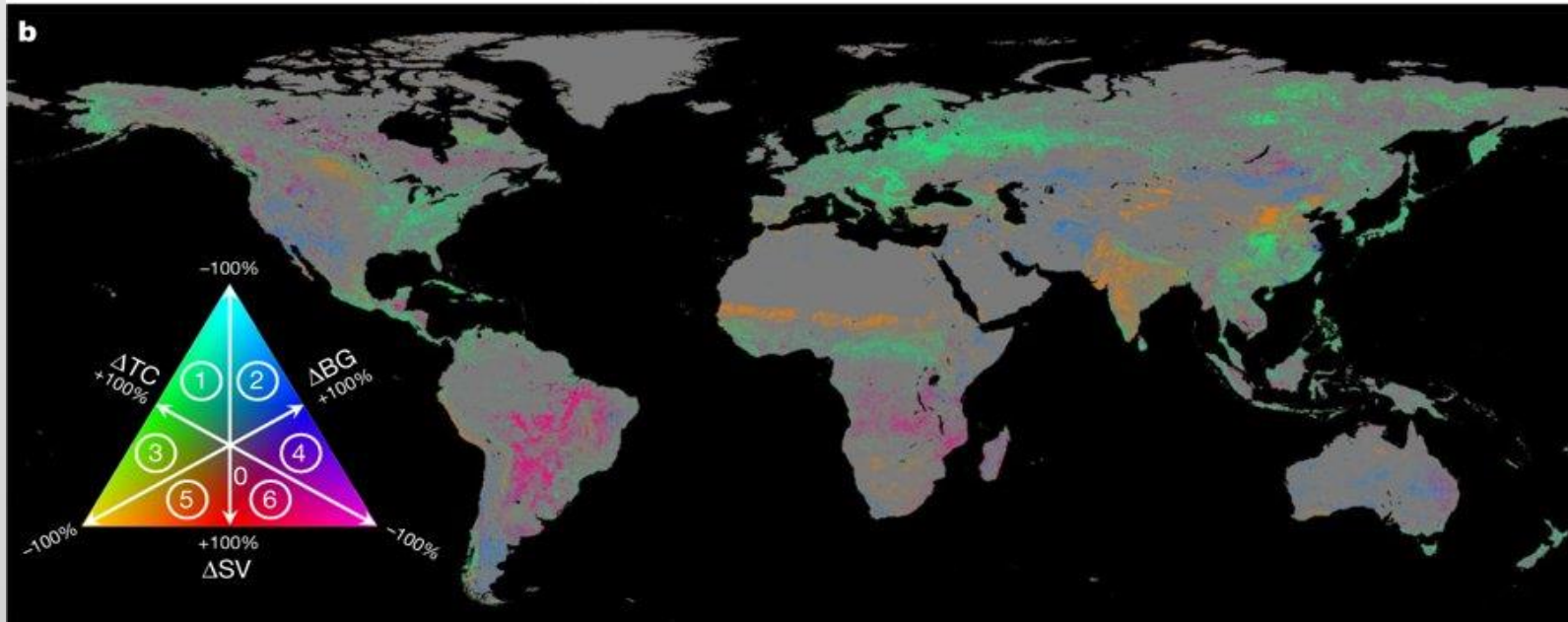
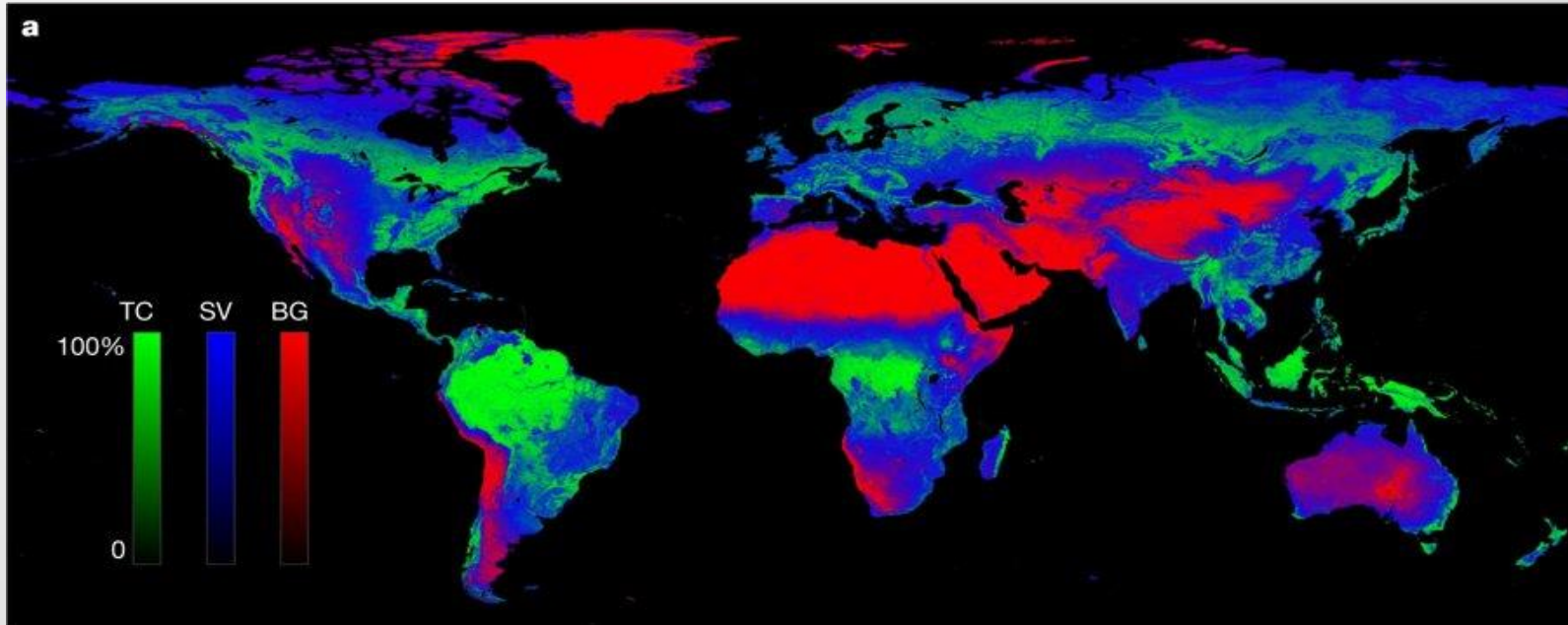
# Technology change is intensifying



## Accelerating Growth in Technology



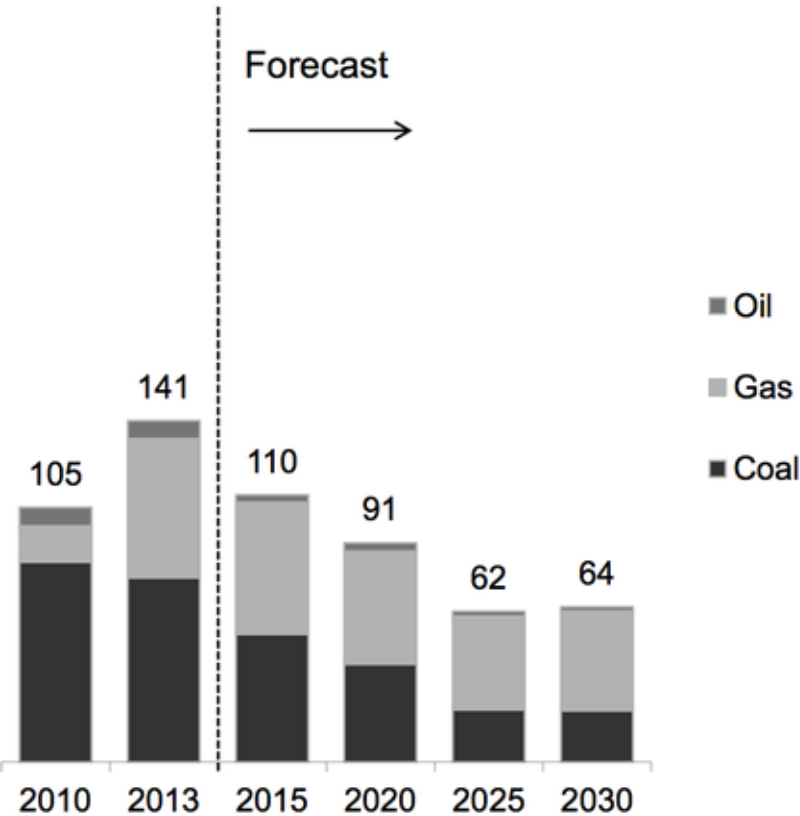
# Reforestation across the Planet exceeds deforestation rates according to NASA



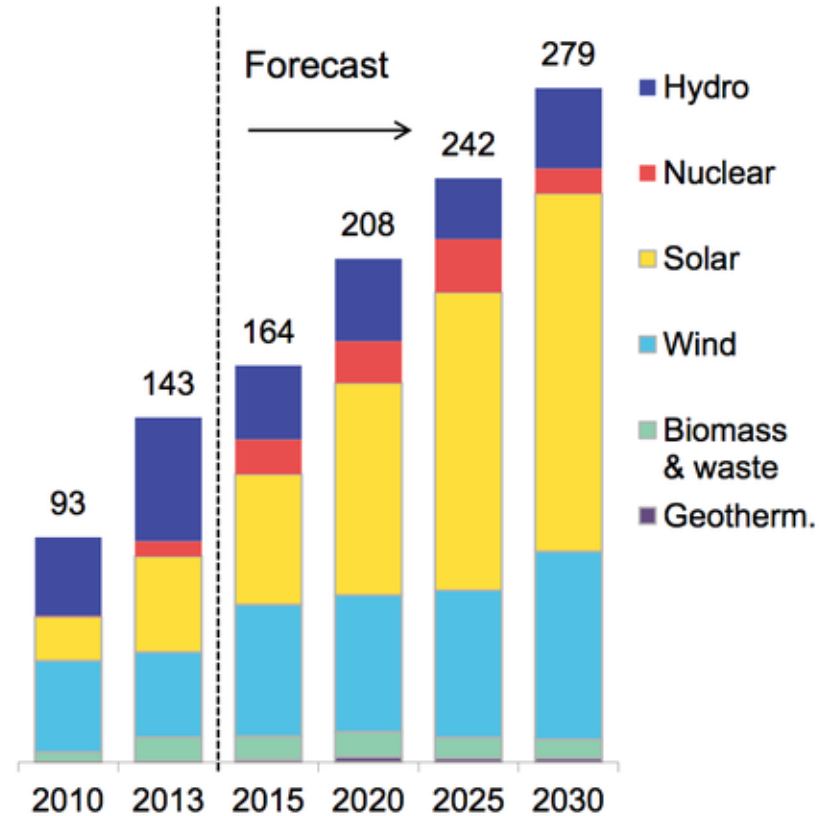
# Renewables investments growing faster than fossil fuel investments



## FOSSIL FUEL



## CLEAN ENERGY



Source: Bloomberg

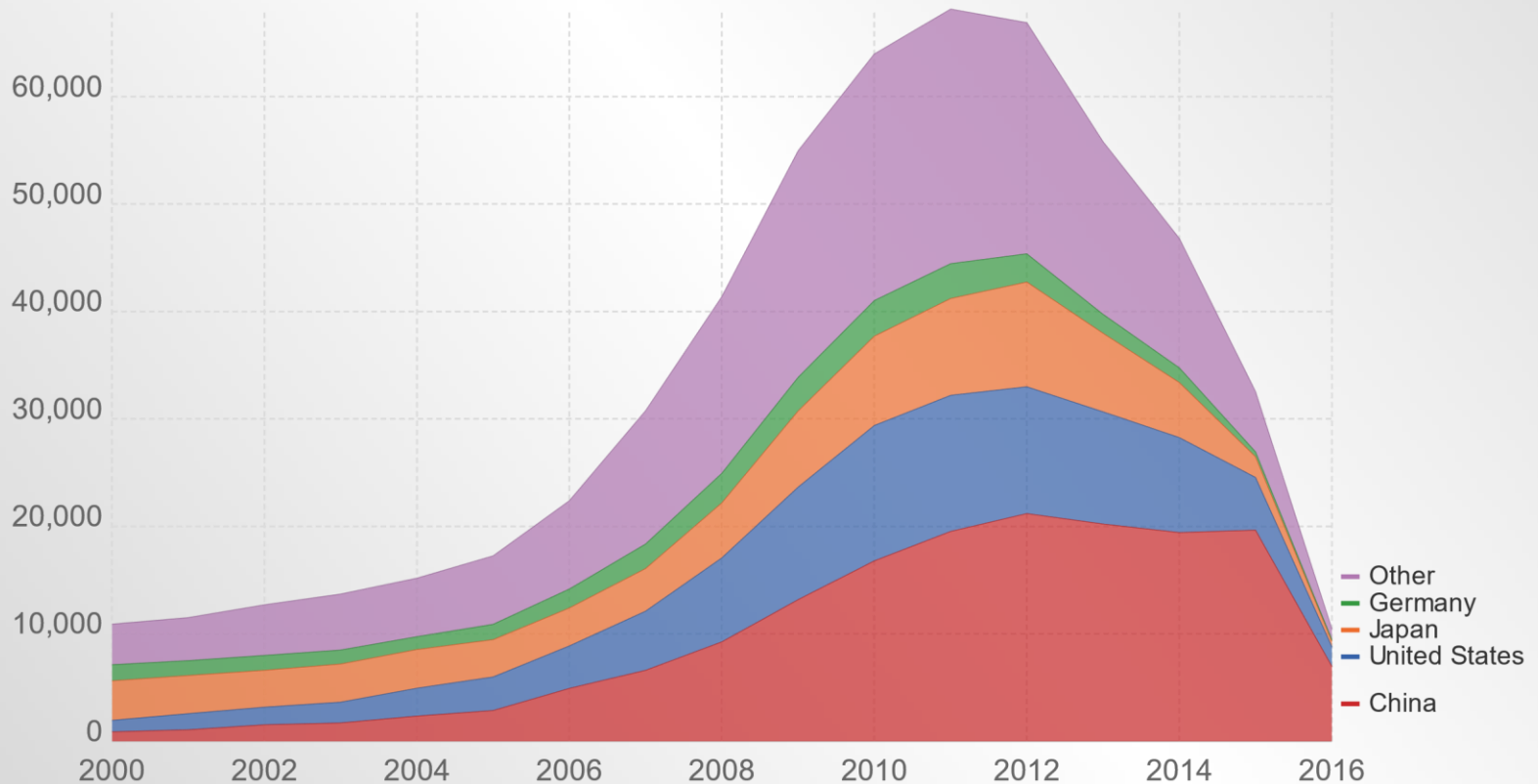
# Slowing of patents for renewables suggest industry has reached technological point of maturity



## Number of patents filed for renewable energy technologies



Annual number of patents filed for innovations in renewable energy technologies, measured in key countries. This includes patents filed in wind, solar (PV and thermal), bioenergy, geothermal, marine, and hydropower. Note that figures for 2014-16 may be subject to a time lag; processing times of patent applications vary and some patents submitted over this period may not yet be recorded in statistics. These figures will be updated with time if additional patent applications are recorded.



Source: IRENA (& EPO PATSTAT)

OurWorldInData.org • CC BY-SA



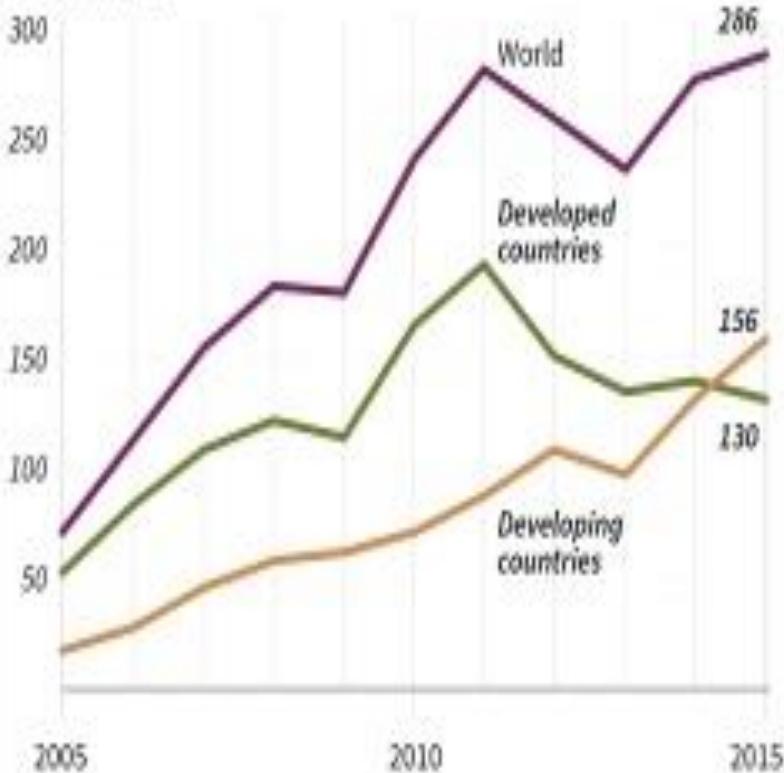
# Developing nations are finally moving on GHG

## Global growth of renewable energy

An estimated 147 gigawatts of renewable power capacity worldwide was added in 2015

### Rise in investment

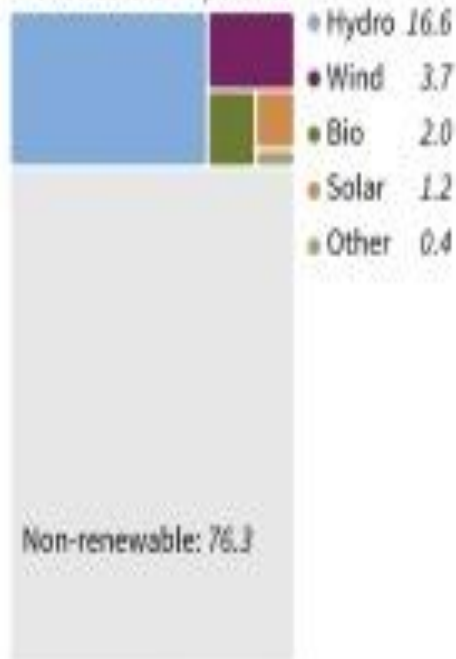
Billion dollars



Source: re21.net

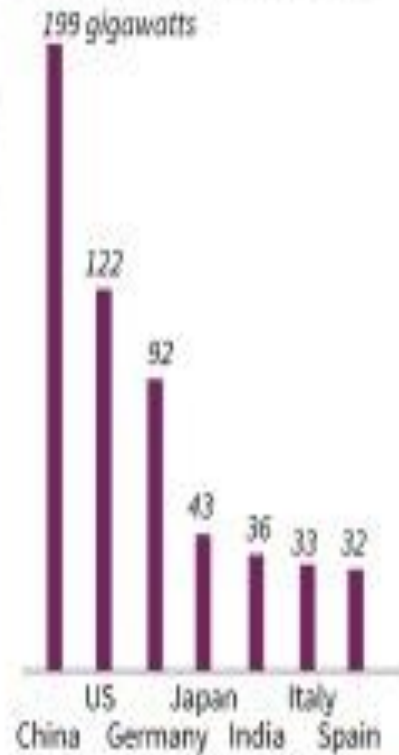
### Share of global electricity production

Renewable: 23.7 percent



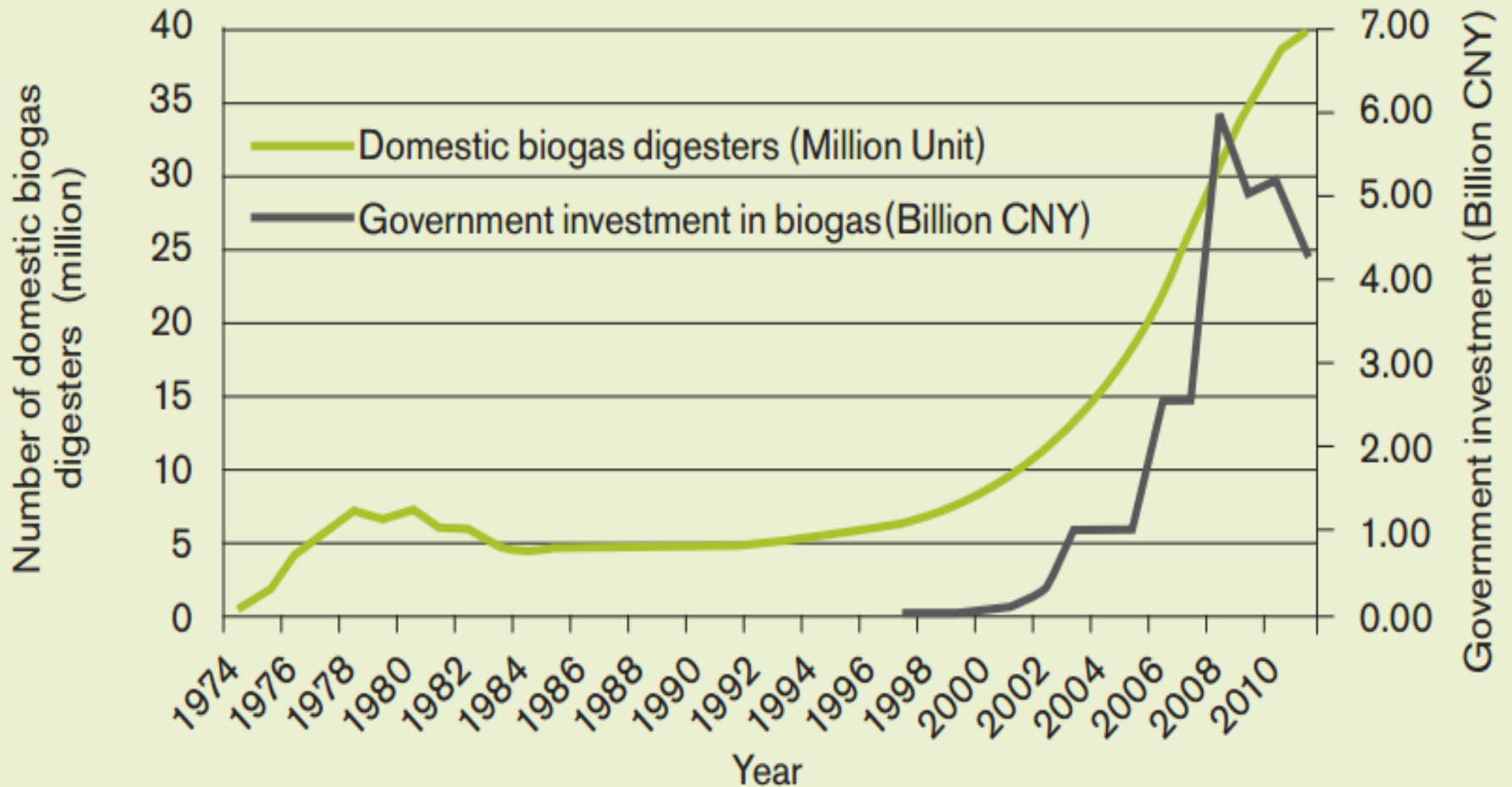
### Renewable power capacity

By country, not including hydro



# China's biogas boom

Figure 2. Number of domestic biogas digesters and government investment in biogas, China (1974-2011)



Note: biogas digester figures are cumulative, while investment figures are annual.

Food waste collections in EU will reduce GHG emissions and produce biogas, compost



# ***CITIES AND CIRCULAR ECONOMY FOR FOOD***



Just 2% of global food waste and loss is recycled back to earth and to energy

# Urban Food Waste Management report published in 2018



The opportunity in Europe following the obligation of food waste collections by 2023 is enormous

[Download for free OSLO City one case study](#)

<http://www.worldbiogasassociation.org/food-waste-management-report/>

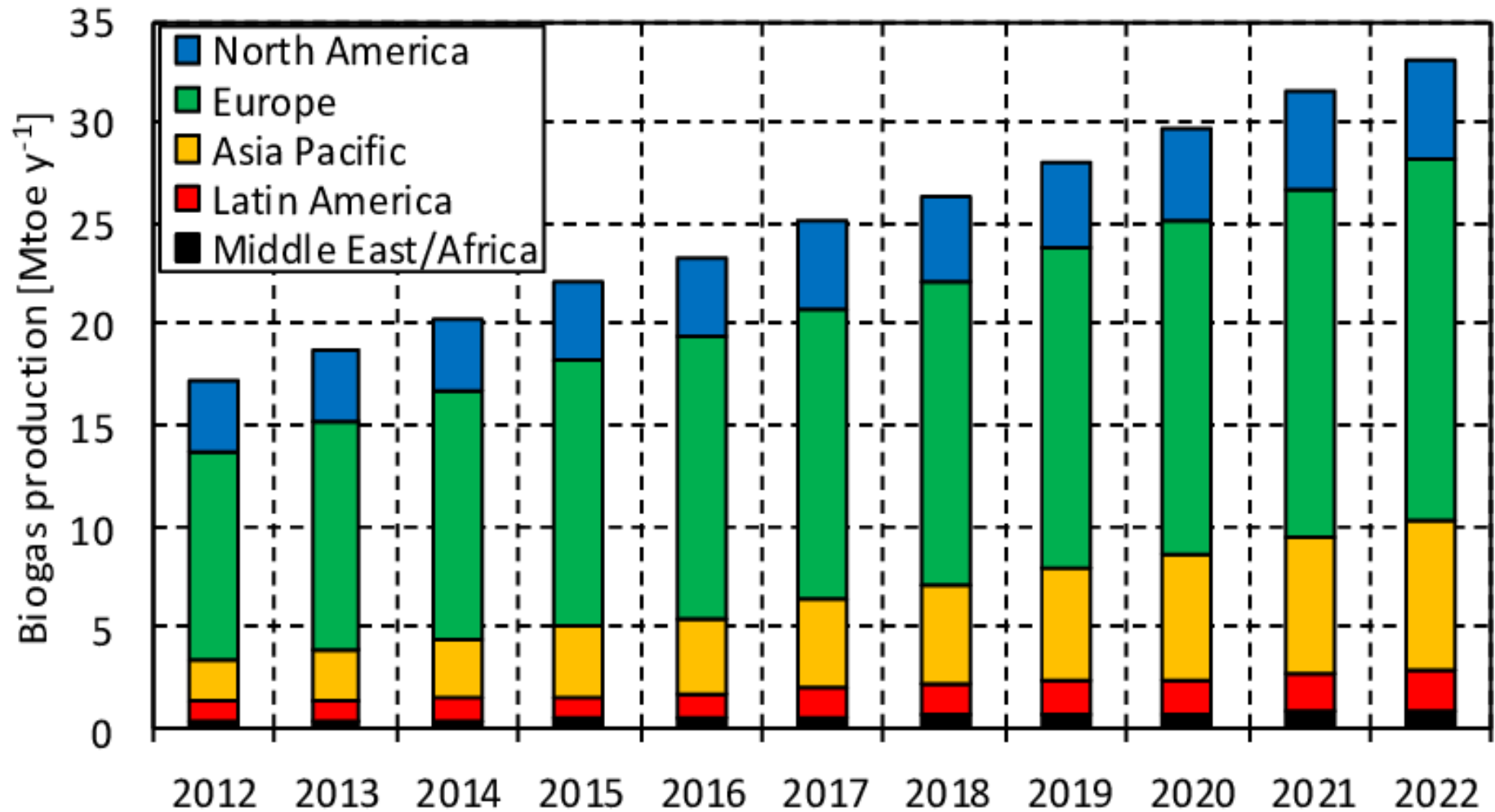


## GLOBAL FOOD WASTE MANAGEMENT: AN IMPLEMENTATION GUIDE FOR CITIES

Full Report



# Global potential of biogas





# Biogas production in top 5 countries in 2014



**China 15.0**

**USA 8.48**

**Thailand 1.30**

**India 0.81**

**Canada 0.79**

**Total (Top 5) 26.4**

**EU - 28 28.9**

**World 58.7**

All values in billion Nm<sup>3</sup>. Top 5 excluding the EU – 28. Source: IEA Key World Energy Statistics

# And other outputs...



The benefit of biogas is not just gas (there is plenty of gas everywhere) but in the unique ability to mix:

## Treatment

Food waste, sewage, agricultural residues, palm oil effluent, crops, agro-industrial wastes, reducing load on environment and GHG emissions by 10-15% globally.

## Outputs

Producing gas and nutrients- digestate, nitrogen, CO<sub>2</sub>, heat

# Conclusions: the challenges we face



Globally we need to eliminate fossil fuel subsidies to create a level playing field in the energy markets and support the Green Climate Fund.

Our industry has to improve performance, eg methane leakage and energy conversion rates

We need to focus on best environmental outcomes for biogas- eg vehicle fuel.

Managing digestate outputs is challenging, eg ammonia emissions, nitrate leaching

Making full use of resources, eg Co<sub>2</sub>, heat, digestate

Systemic consolidation >600,000 tonnes treated capacity near cities eg Milan:  
15.8 electric MWh; 32 million M<sup>3</sup> biomethane; 38,000 T liquid Co<sub>2</sub>; 90,000T  
compost

# Thanks for your attention



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# Thanks for your attention



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