

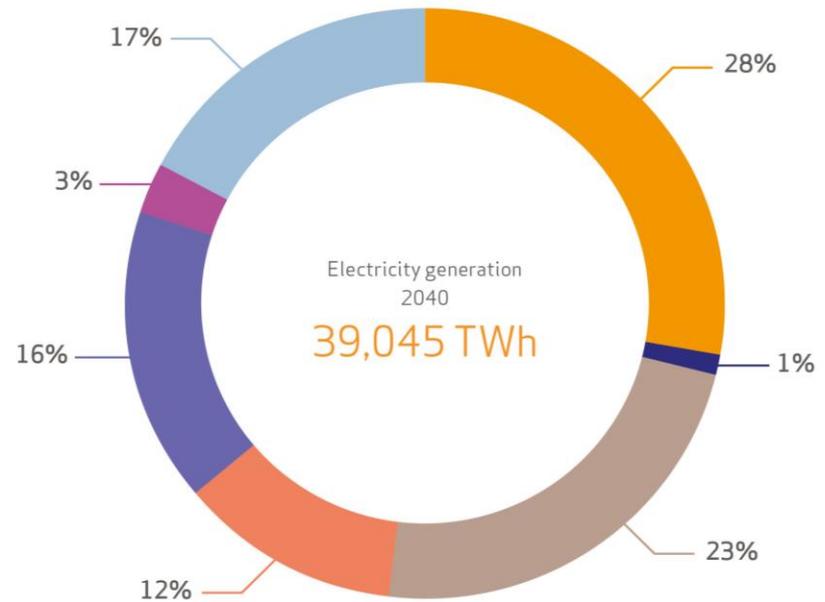
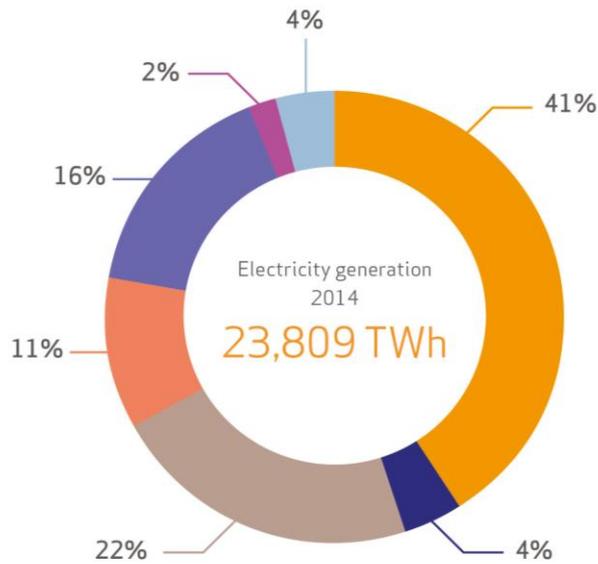
# The new global dynamics for coal

Benjamin Sporton  
Chief Executive



# As electricity changes, coal retains an edge

## Global electricity mix



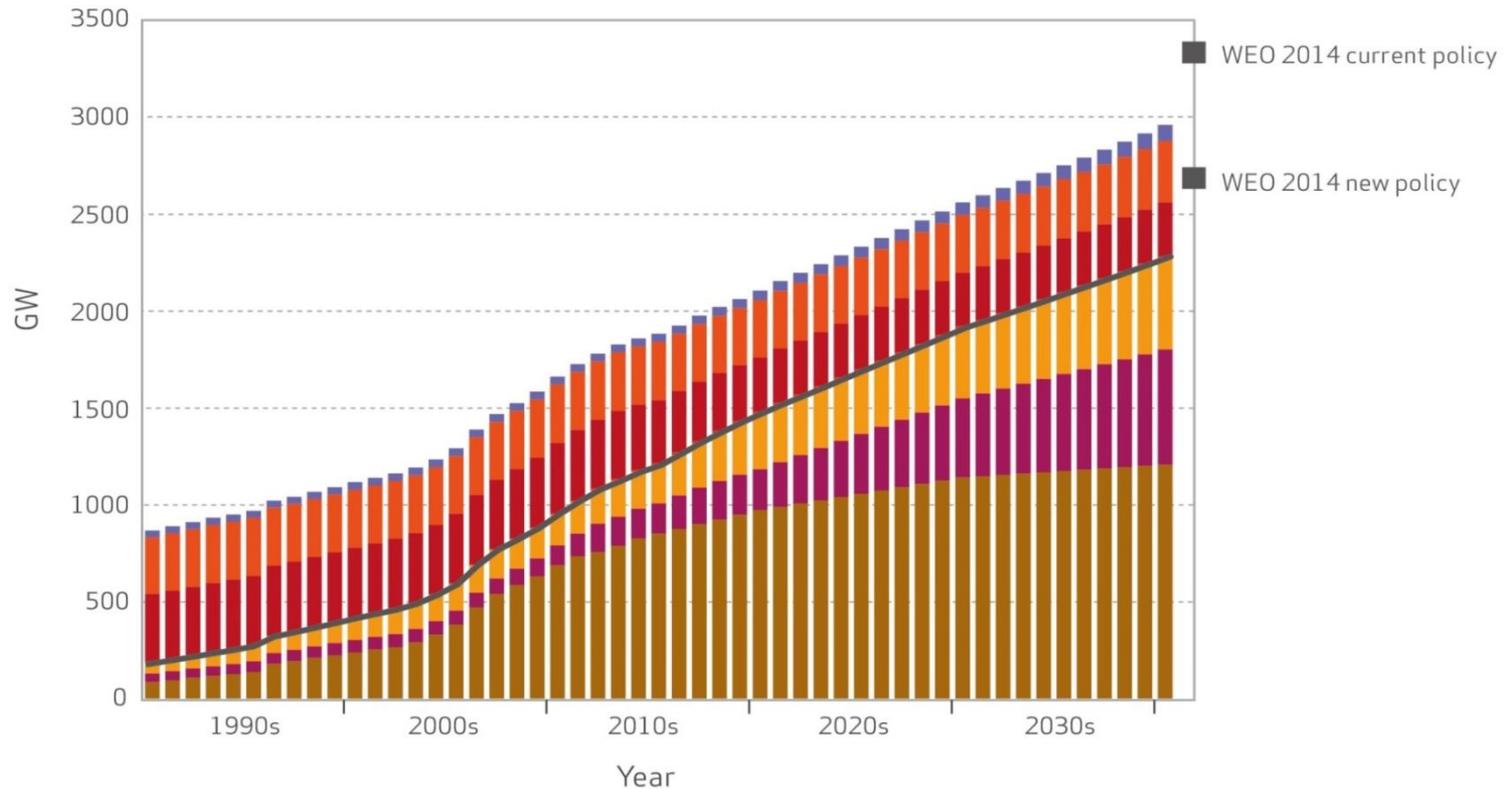
Source: International Energy Agency, World Energy Outlook 2016

## Two trends to watch

- Asian energy demand  
*(and how it's met)*
- Urbanisation

# Asia will drive new coal-fueled power capacity

## Installed Coal Generation Capacity by Country/Region



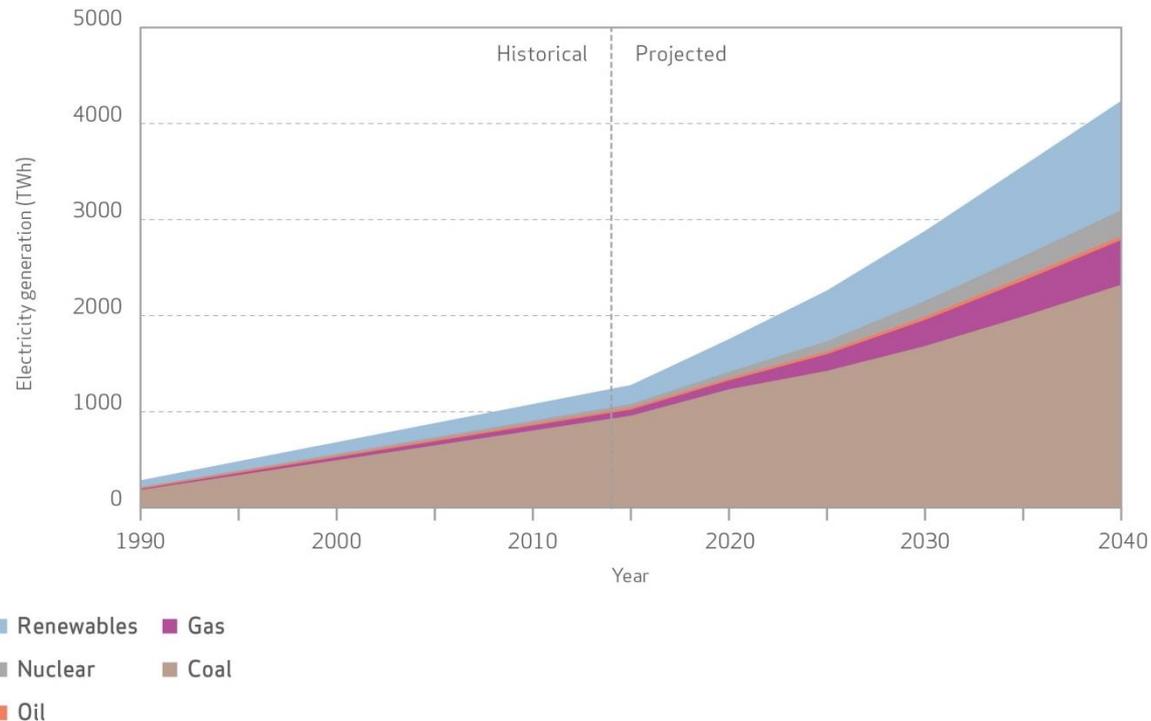
- Africa
- Europe and Mediterranean
- North America
- South America & Central America
- Taiwan, Japan, Korea & Other Asia
- India
- China
- All Asia Total

Source: World Coal Association analysis

# Coal will drive India's economic growth...

## India's electricity generation by source in the New Policies Scenario

- Electricity demand in India is expected to average 4.4% pa over the next 25 years
- Coal generation capacity more than doubles, while renewables also increase significantly to meet demand
- IEA indicates that maintaining an adequate electricity supply represents a significant investment challenge requiring \$2 trillion (in 2013 dollars)

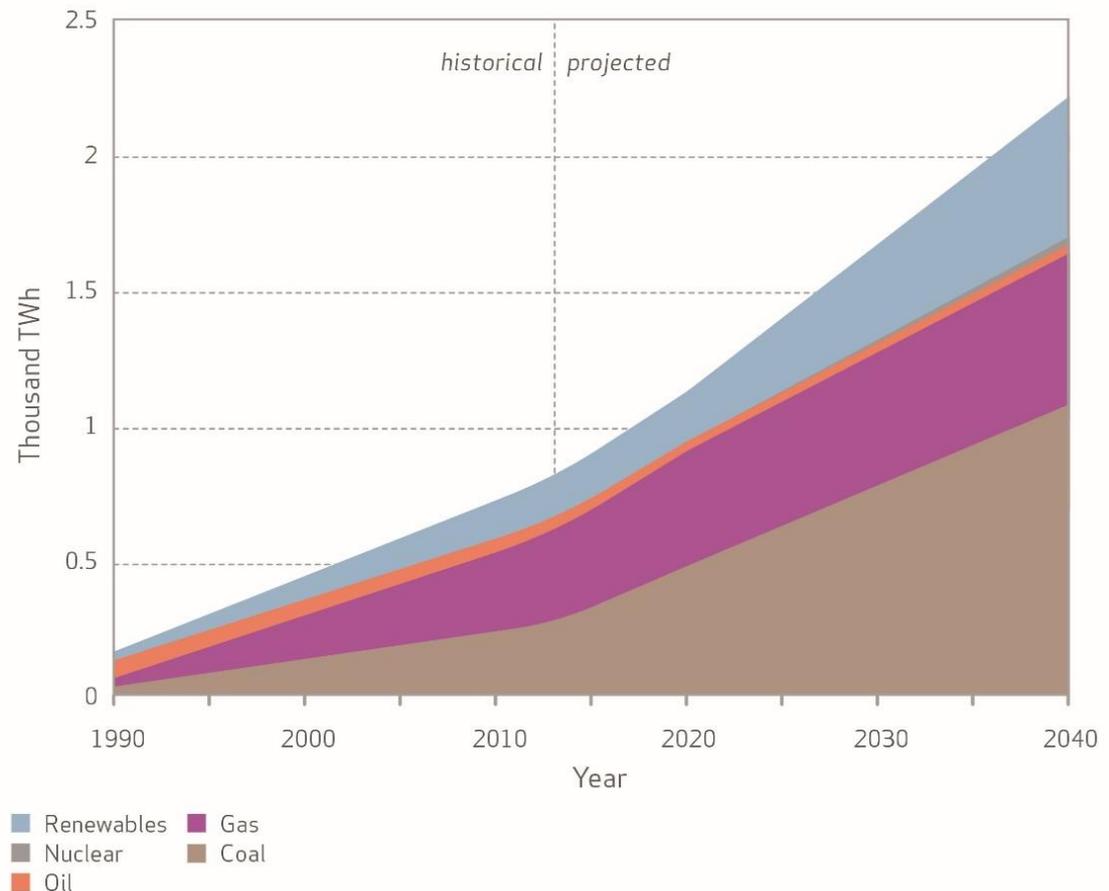


Source: International Energy Agency, World Energy Outlook 2016

# ... and will be critical in powering up SE Asia

- The share of coal in power generation rises from 32% to 50%
- Renewables-based electricity generation increases three and half times from today to 2040 (481 TWh)
- IEA highlights \$2.4 trillion investment is required over the period to 2040. This represents around 5% of the global total, or one-third of China's investment

Southeast Asia electricity generation by source in the New Policies Scenario

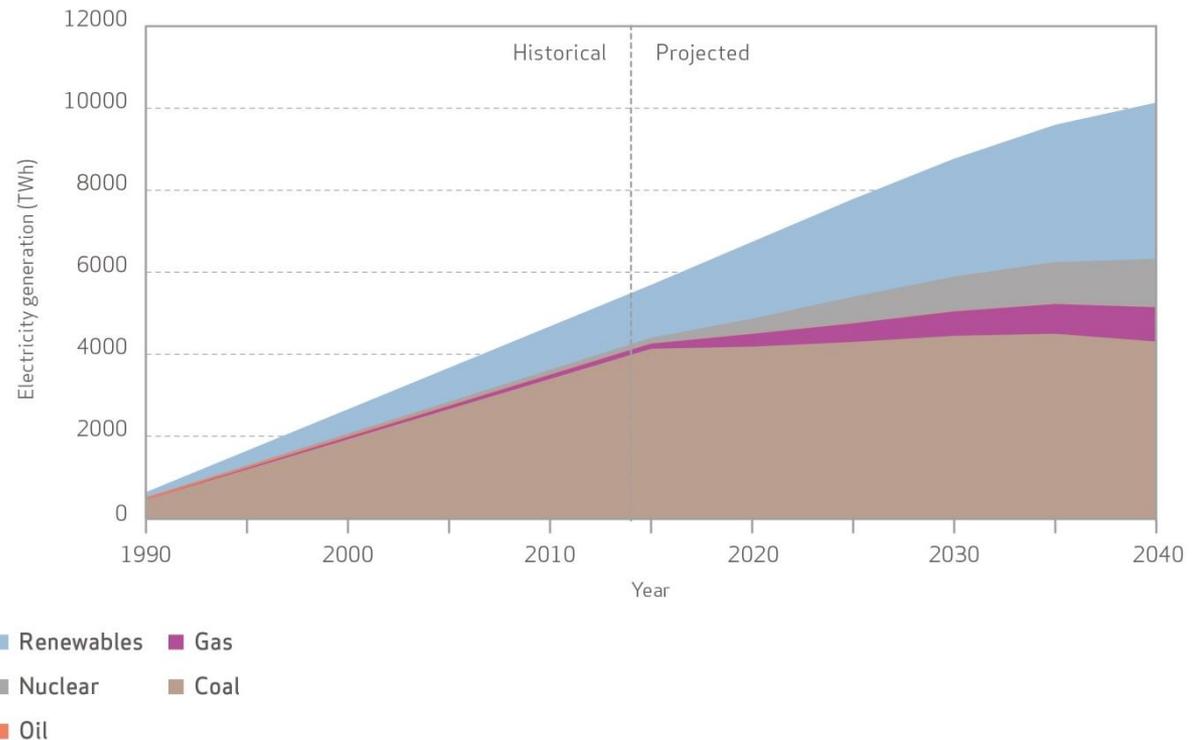


Source: Adapted from IEA WEO 2015

# Coal will be critical to China for decades

## China's electricity generation by source in the New Policies Scenario

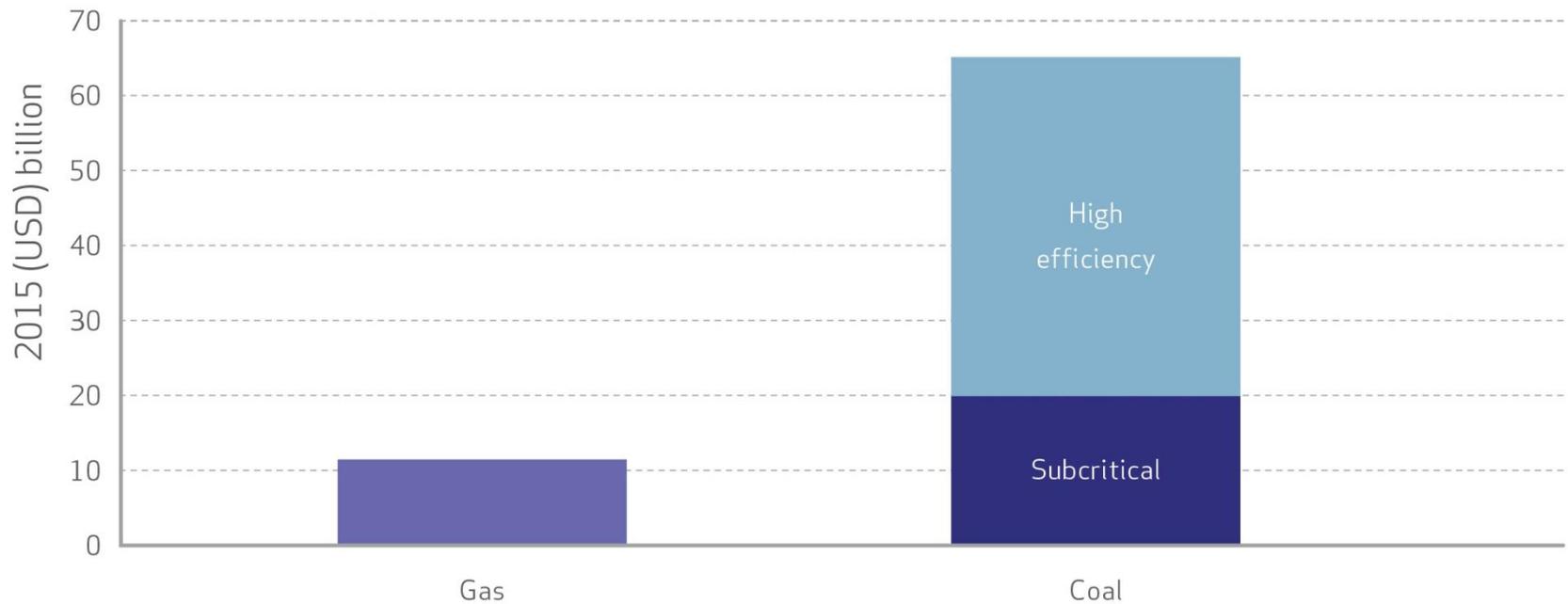
- China's electricity demand growth will be around 4.8% to 2020, then decline to around 2% through to 2040
- Electricity generation from coal will be 4.3% higher in 2040, despite its share of generation reducing from 73% to 43%
- Non-hydro renewables are expected to increase 1200% over the same period (25% of world generation)



Source: International Energy Agency, World Energy Outlook 2016

# Coal, not gas, leads the charge in Asia...

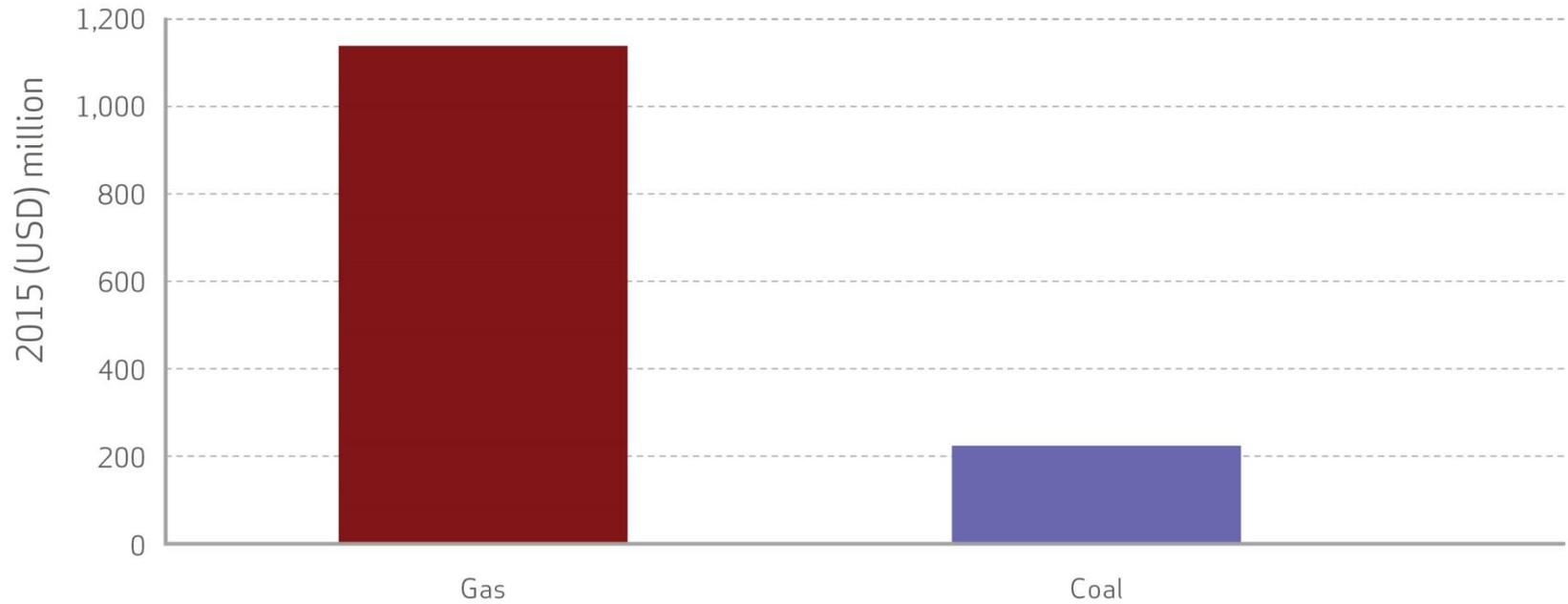
Coal and gas-fired power investment in Asian markets (2015)



Source: IEA World Energy Outlook 2016

... because its costs are far lower

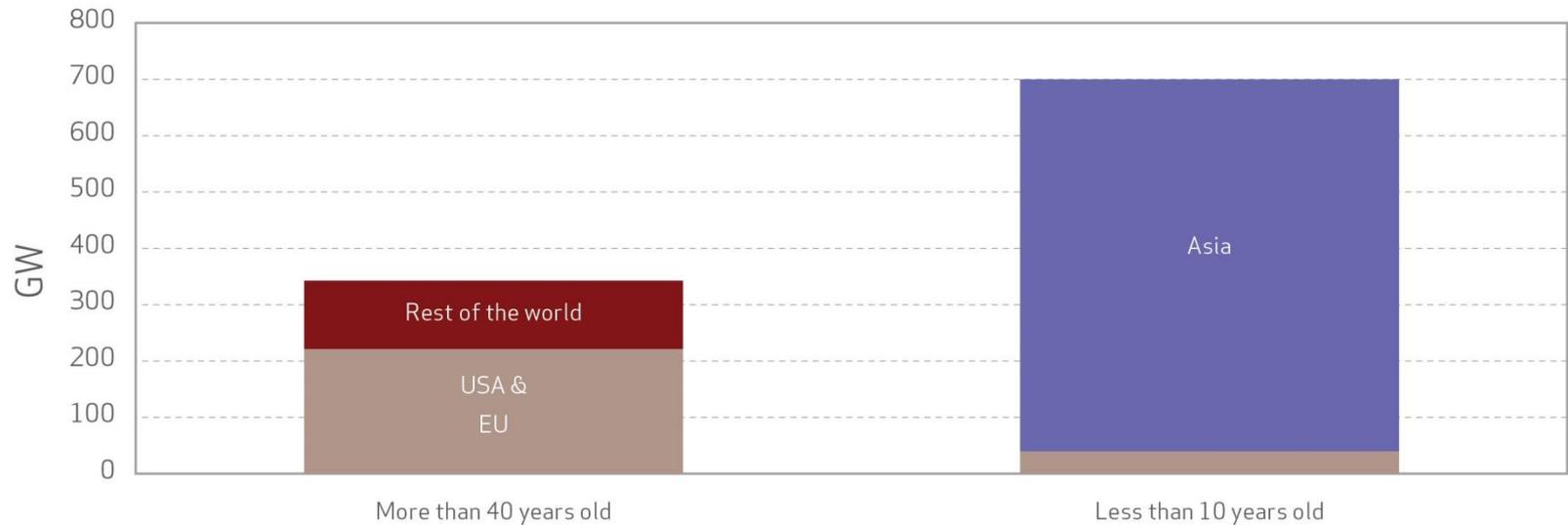
### Infrastructure investment cost for a 1 GW power plant in Asia



Source: IEA World Energy Outlook 2016

# So the global coal fleet is at its youngest in decades

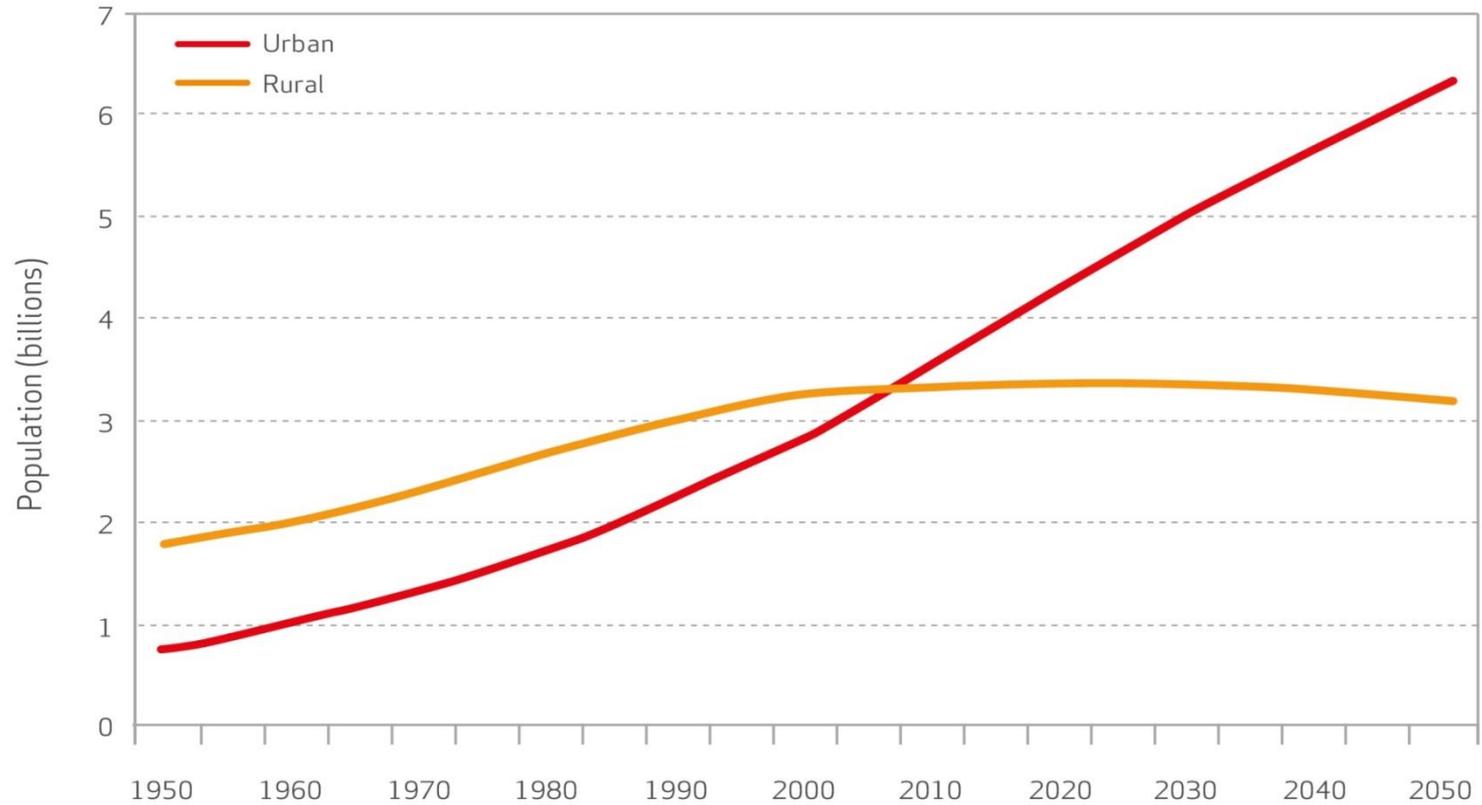
## Age of coal plants globally



Source: International Energy Agency, Laszlo Varro, Chief Economist, 2016

# Urbanization is transforming developing economies

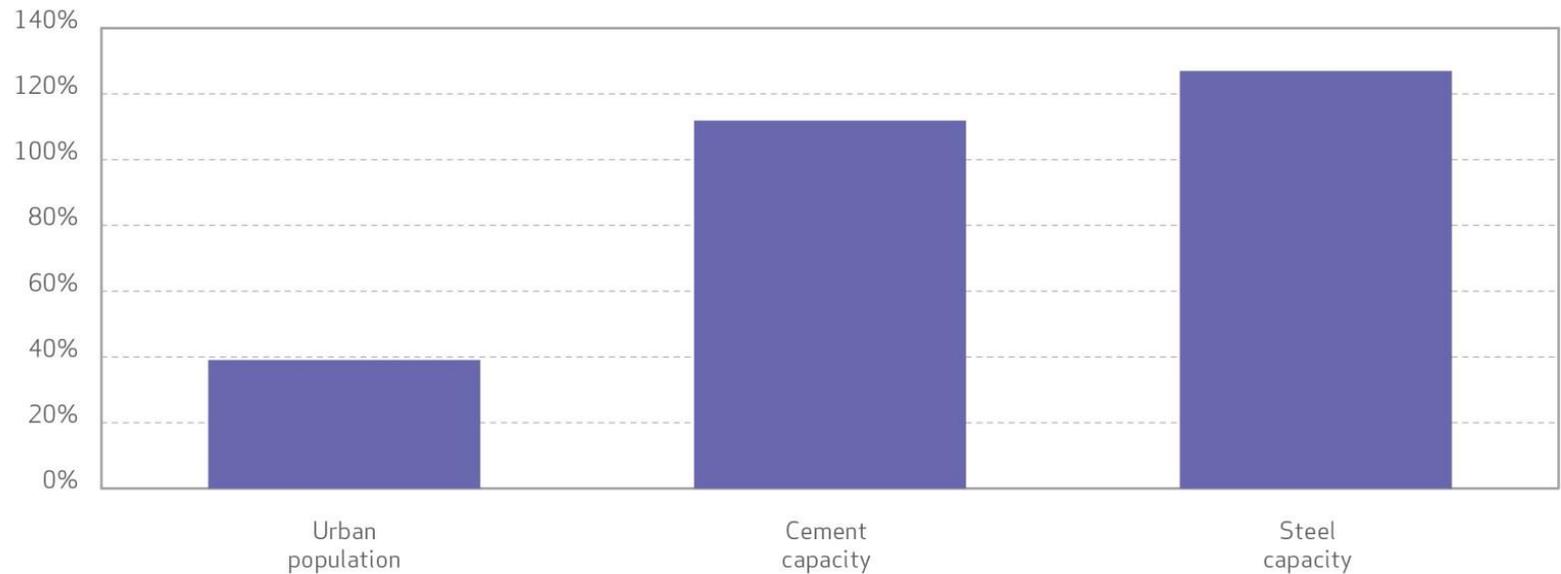
Estimated and projected populations in urban and rural settings, 1950-2050



Source: UN Population Division

# Urbanisation drives demand for coal-based products

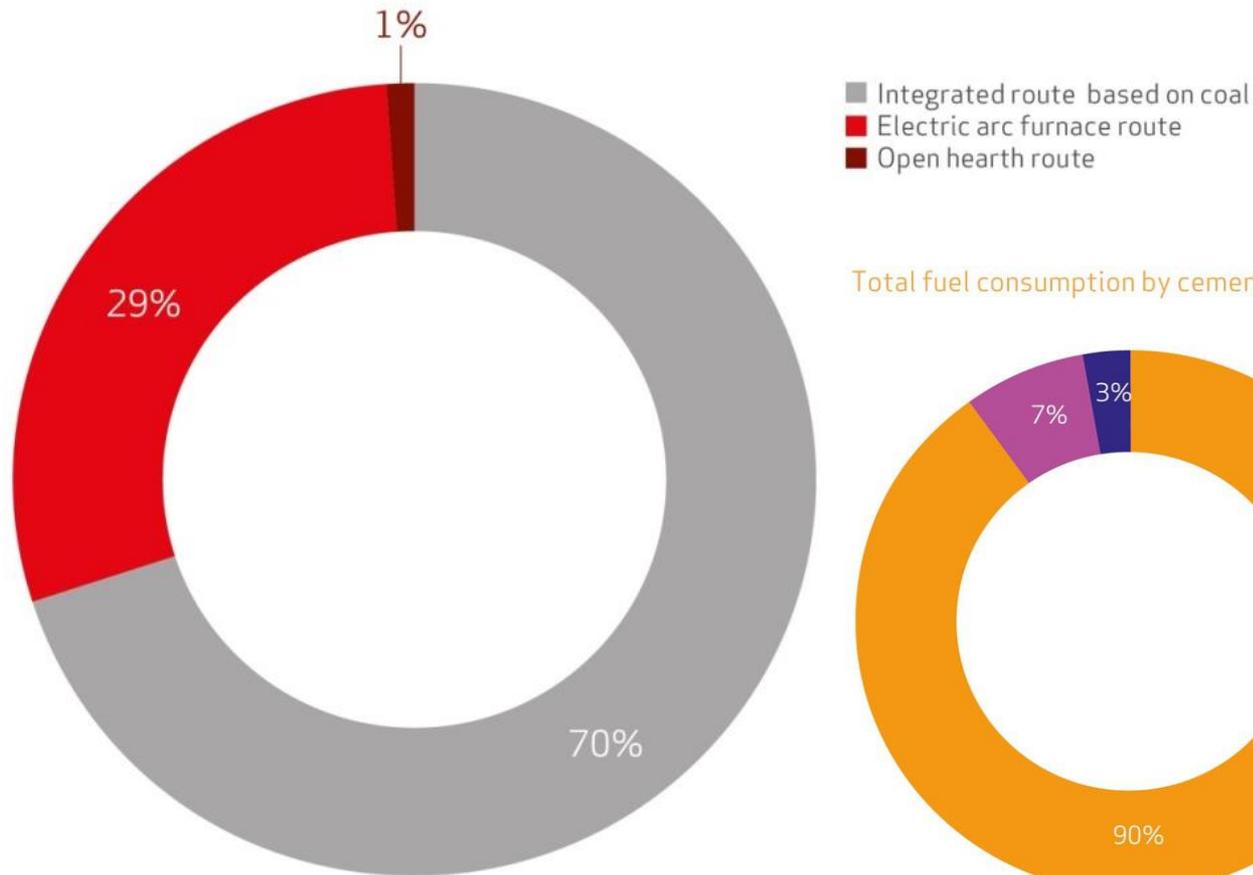
## Urbanisation trends 2000 - 2015



Source: International Energy Agency, Laszlo Varro, Chief Economist, 2016

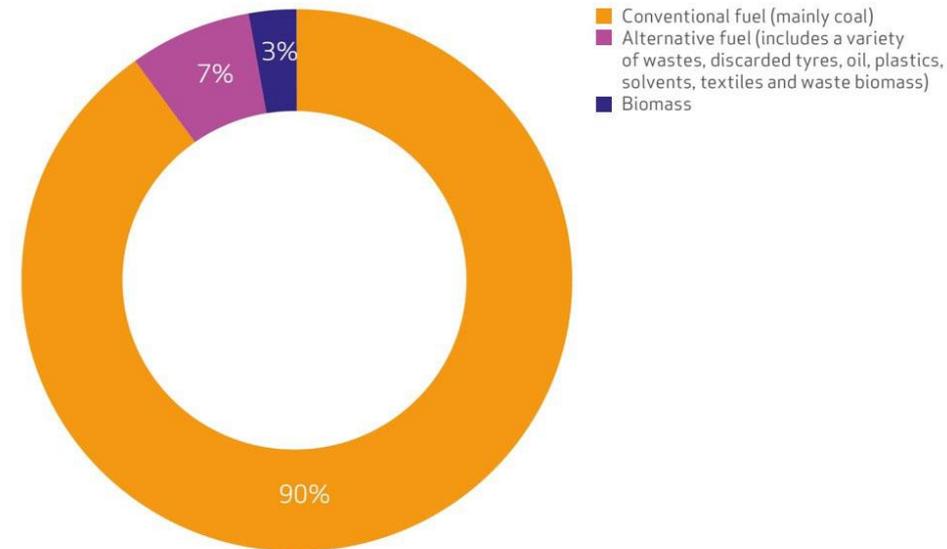
# We rely on coal to build the modern world

## Crude steel production by process



Source: World Coal Association

## Total fuel consumption by cement



Source: World Coal Association



**What does coal's continued global role mean for climate policy?**

# The Paris Agreement includes low emissions coal

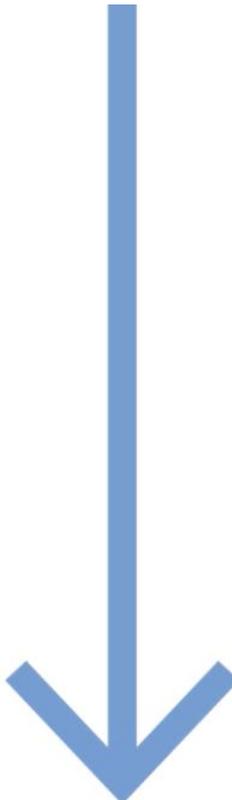


# New technology dramatically reduces CO<sub>2</sub>

For every  
**1%**  
efficiency  
improvement

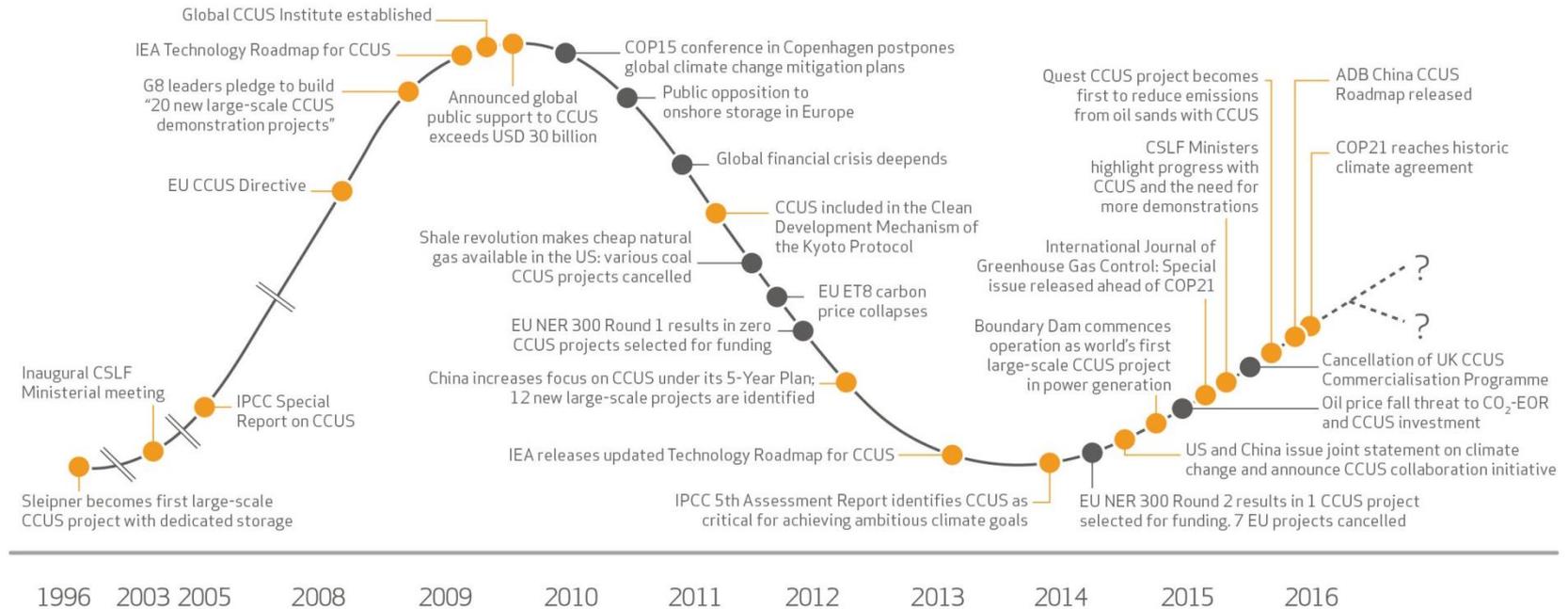


we get  
**2-3%**  
reduction in  
CO<sub>2</sub> emissions



# CCS has faced a tumultuous policy environment

## Fluctuating policy and political support for CCS



Source: IEA (2016), 20 years of Carbon Capture and Storage: Accelerating Future Deployment. Figure adapted from SBC Energy Institute (2016), Low Carbon Energy Technologies Fact Book Update: Carbon Capture and Storage at a Crossroads.

# A new phase of US energy and climate policy



# The US is already a leader in cleaner coal

Petra Nova post combustion capture,  
Texas

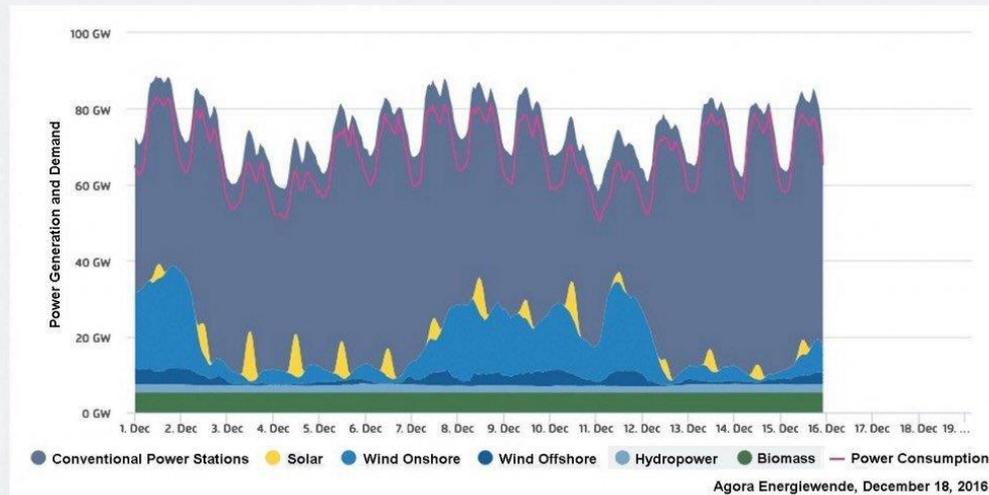


Kemper County IGCC,  
Mississippi

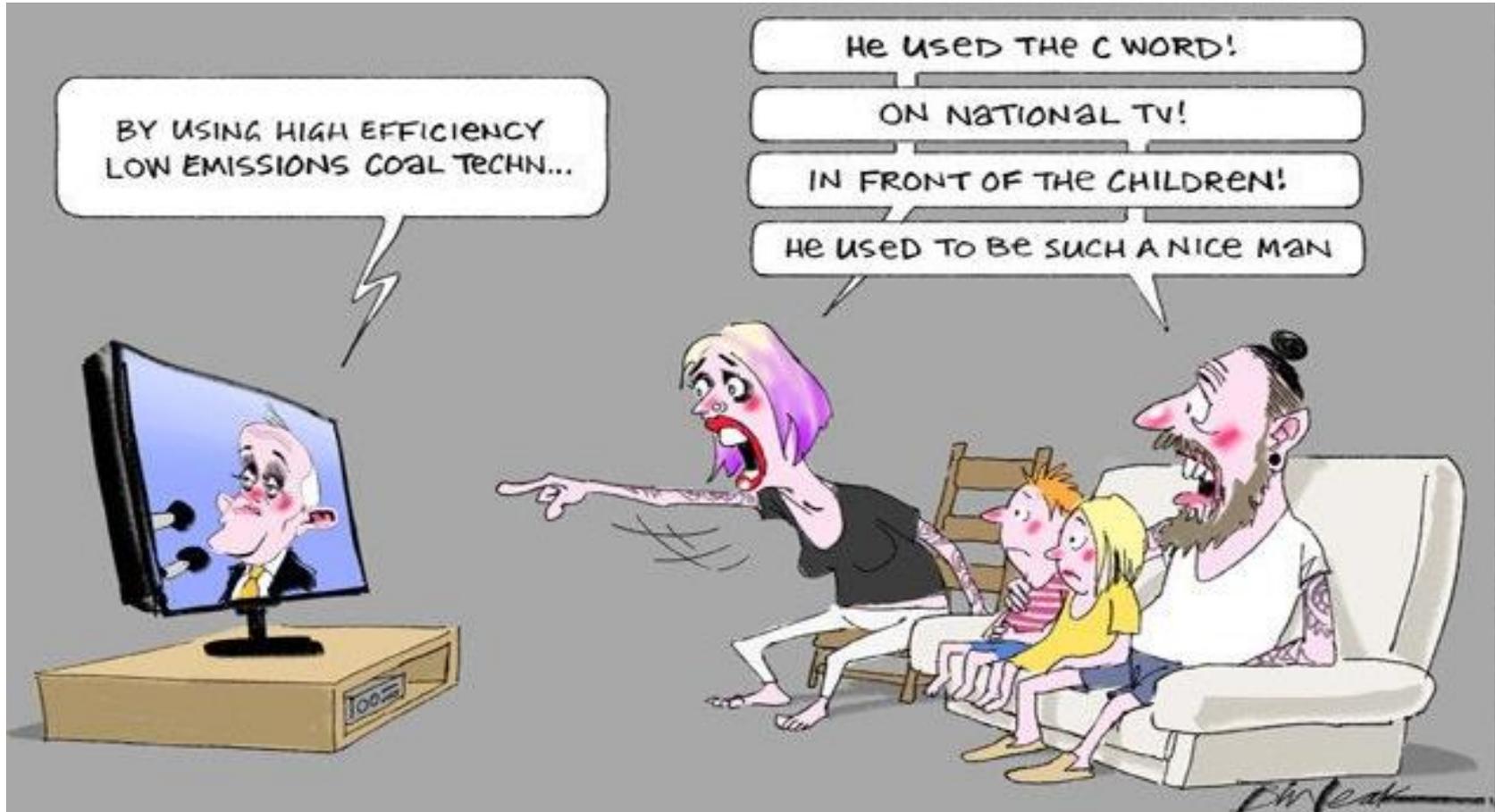


# There are real challenges to high renewable penetration

Power Generation and Demand, Germany December 2016



# Coal should not be a dirty word





# WORLD COAL ASSOCIATION

[www.worldcoal.org](http://www.worldcoal.org)  
[info@worldcoal.org](mailto:info@worldcoal.org)