



# Energy Efficiency and Green Cities

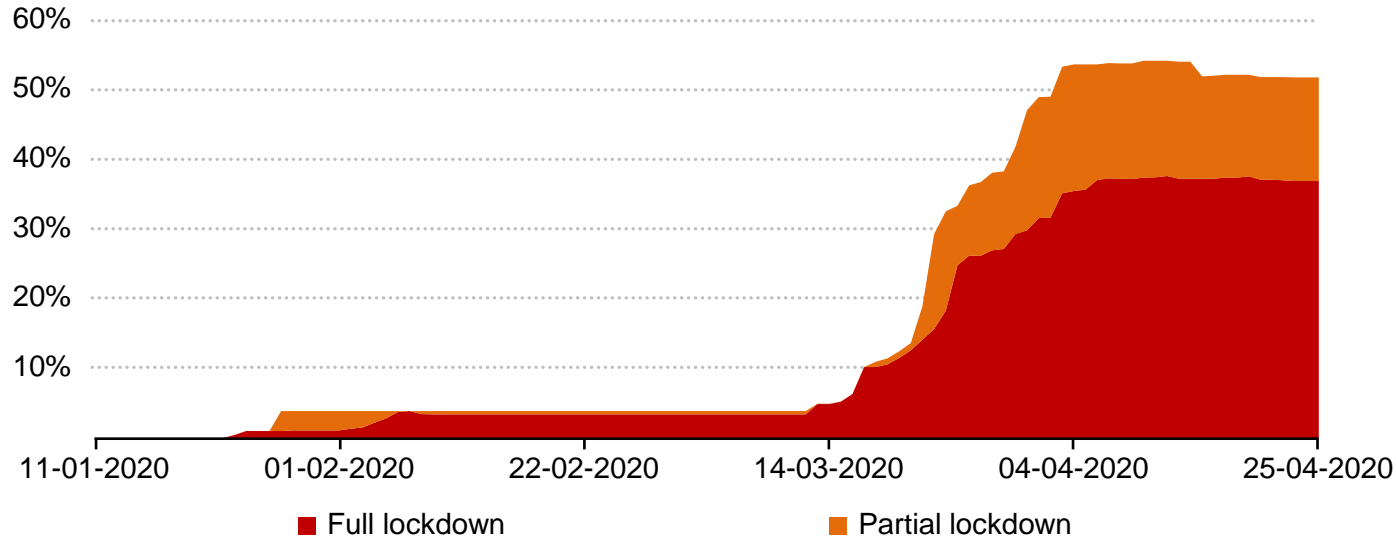
ESIG Webinar: Green Cities and Energy Systems Integration

Brian Motherway, Head of Energy Efficiency

 @BrianRMotherway

# A world in lockdown

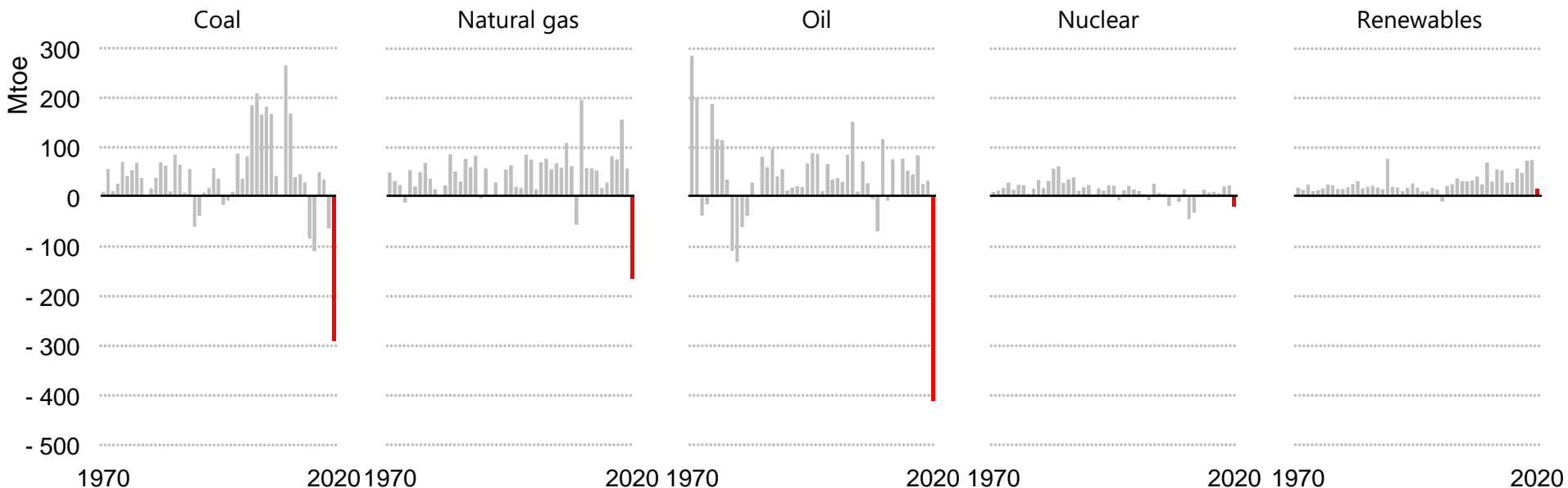
Share of global energy use affected by virus containment measures



The coverage of COVID-19 lockdown measures jumped from 5% of global energy demand in mid-March to over 50% by early April. Measures are expected to ease in a handful of countries in early May.

# Fossil fuels are set for a dismal 2020 – Renewables so far most resilient

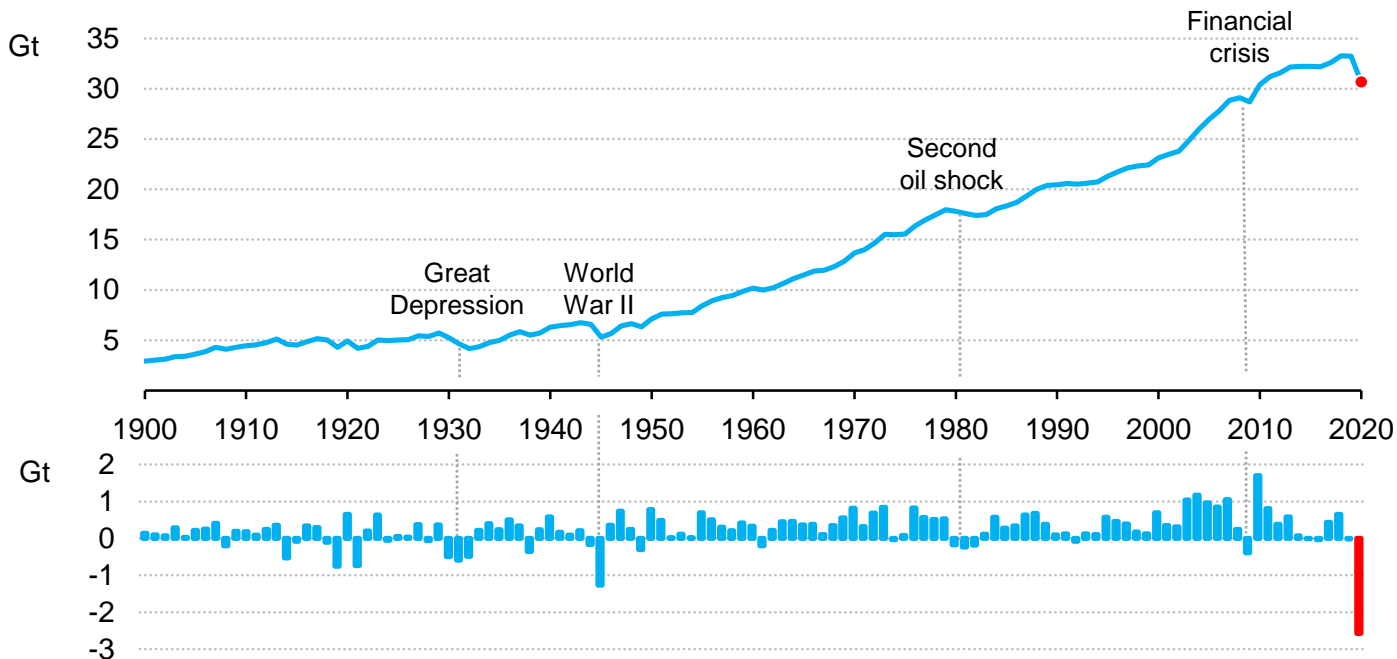
Change in global energy demand by fuel, 1970– 2020



Coal is set for the largest decline since World War II, alongside sharp reductions for gas and oil. Nuclear power is less affected by lockdown measures, while renewables are the only energy source on the rise in 2020.

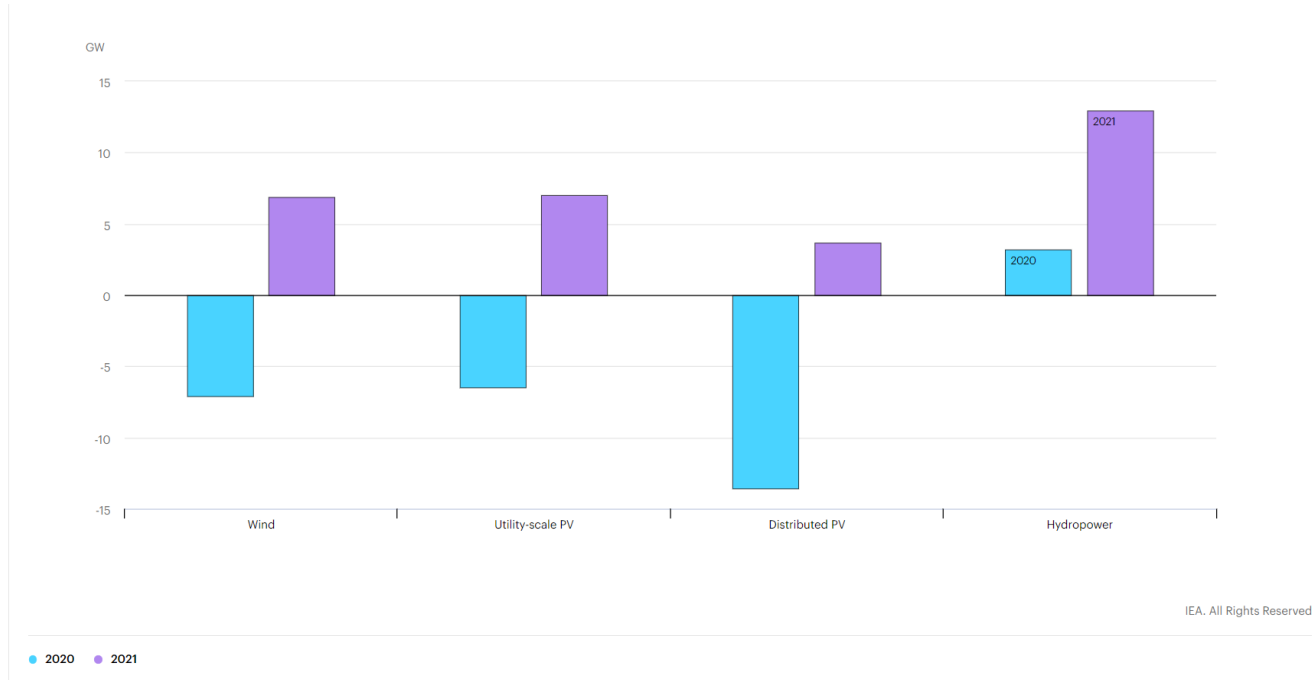
# CO<sub>2</sub> emissions drop the most ever due to the COVID-19 crisis

Global energy-related CO<sub>2</sub> emissions and annual change, 1900-2020



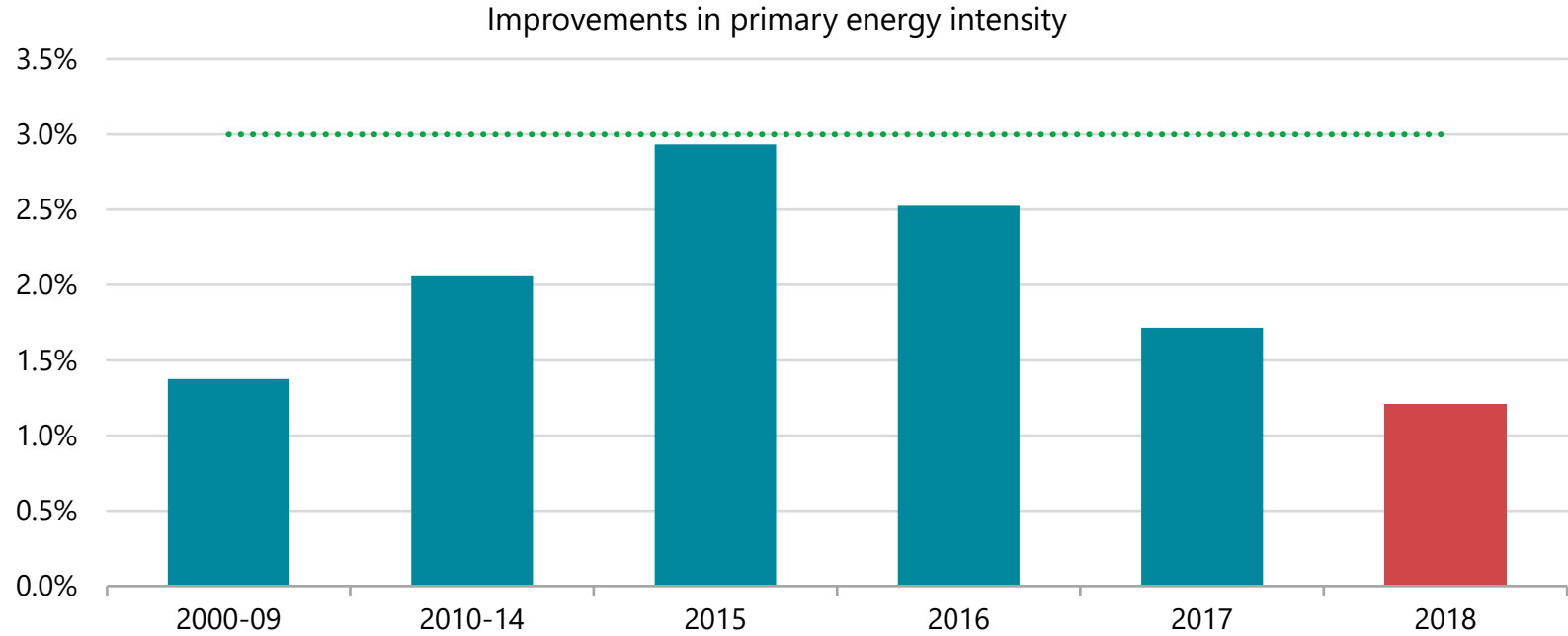
Global energy-related CO<sub>2</sub> emissions are set to fall nearly 8% in 2020 to their lowest level in a decade. Reduced coal use contributes the most. Experience suggests that a large rebound is likely post crisis.

# Renewable energy growth continues but slows



Changes in additional capacity growth compared to previous year

# Global energy efficiency improvements are slowing down



In 2018 the global economy produced 1.2% more value for every unit of energy used compared to 2017. Cost-effective opportunities exist to deliver an annual improvement rate of 3%.

# IEA's call to put clean energy at the heart of stimulus plans

---

IEA is working with governments around the world on economic recovery

- IEA's COVID-19 Hub: <https://www.iea.org/topics/covid-19>

The implications of the pandemic for energy systems and clean energy transitions are still evolving but three areas in particular stand out:

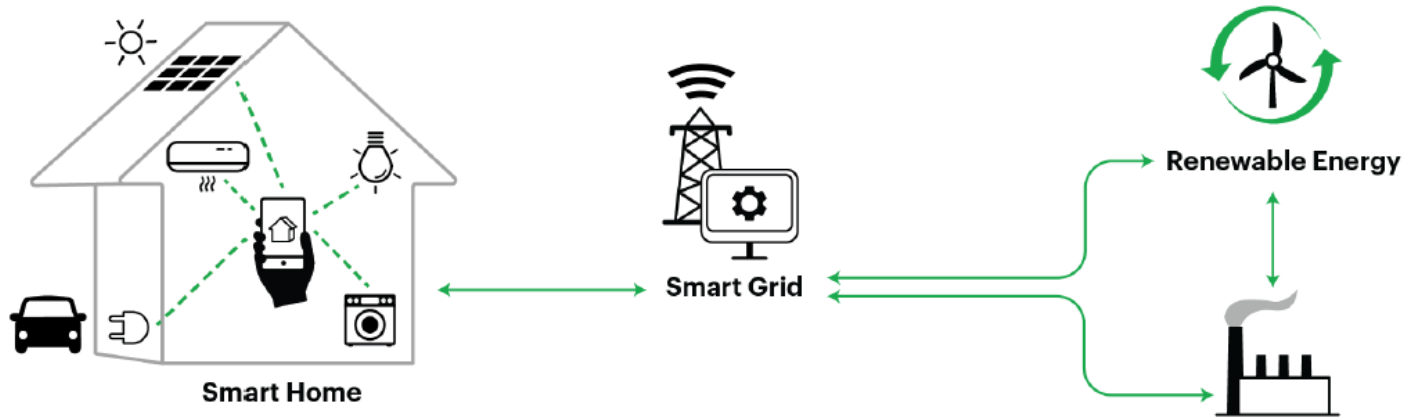
- *Energy security* remains a cornerstone of our economies especially during turbulent times;
- *Electricity security and resilient energy systems* are more indispensable than ever for modern societies;
- *Clean energy transitions* must be at the center of economic recovery and stimulus plans.

# Digitalisation empowering systems thinking

Digitalisation connects and coordinates devices and equipment, leading to greater energy efficiency gains.

Digitally-connected buildings communicate with the grid, providing new sources of flexible load.

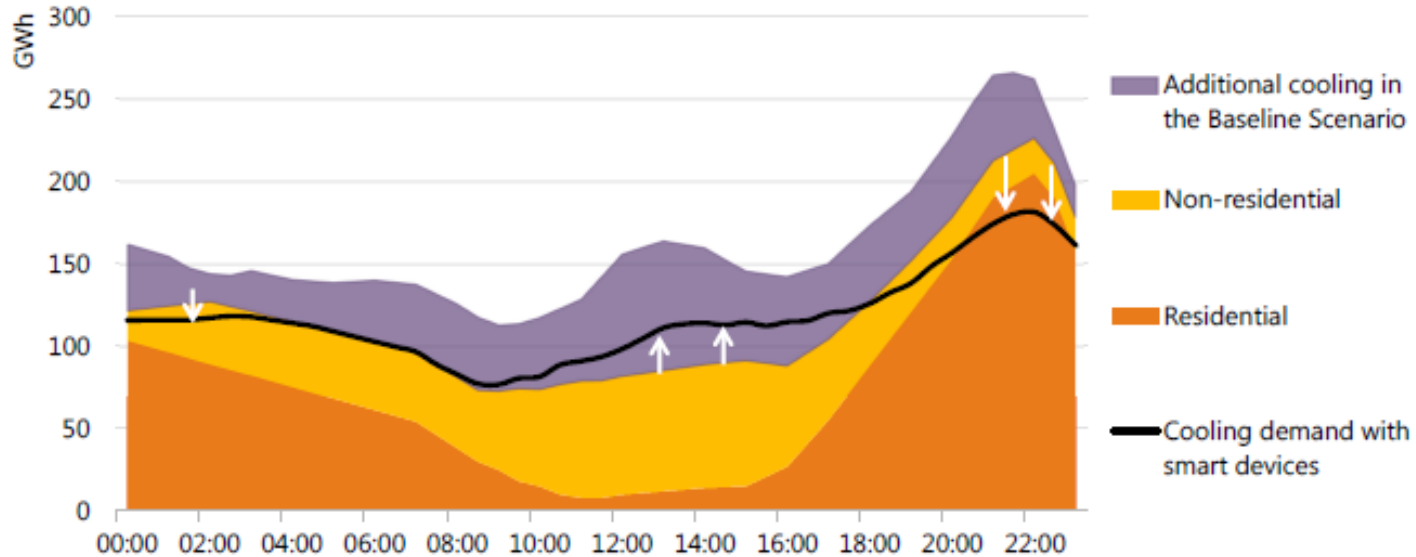
More intermittent renewables are able to be used when they are available, making the system more efficient and stable.



Digitalisation, with the right policies, enables a progression to optimising the efficiency of the whole system and enabling optimum distributed energy systems.

# Meeting the challenge of rising cooling demand through efficiency

Illustrative profile of a July weekday cooling load in Chinese urban areas in 2030 using responsive devices



IEA 2019. All rights reserved.

IEA (2019) *The Future of Cooling in China*

Improved AC energy performance can reduce peak electricity demand, while further reduction can be achieved through connected and flexible ACs enabling demand-side response.



# Why cities?

---

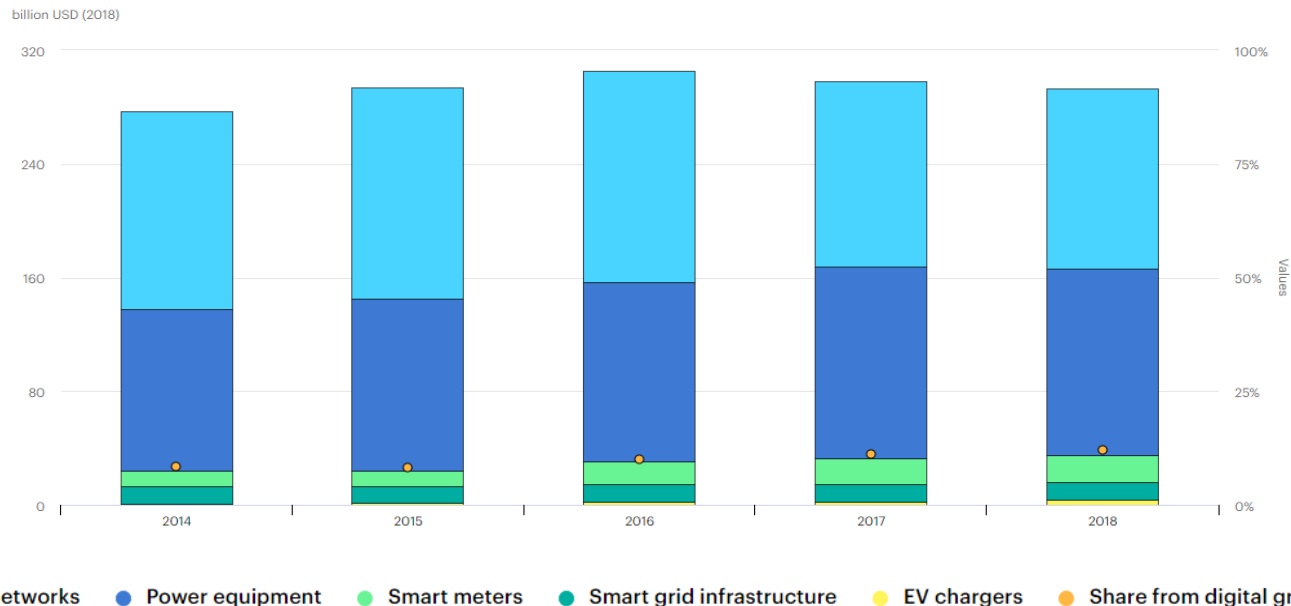
Share of global population living in urban areas projected to rise from 54% today to 64% in 2040 -equivalent to 78 million additional urban dwellers on average each year, predominantly in emerging and developing economies

About one third of energy urban GHG mitigation potential is in the hands of national government, one third local government; and one third shared

National governments cannot drive clean energy transitions on their own: local governments & collaborative action across tiers of gov. play a critical role (e.g. building codes, distributed RE, EV charging infra. and mass transit).

# Smart grids can enable demand flexibility at the city & end-user level

Investment in smart grids by technology area, 2014-2018



Although smart grid investments rose 10% in 2018, these technologies still represent a small share of all investment in network infrastructure.

# Policy is key to accelerate digitalisation for energy efficiency

Policy principles comprising the Readiness for Digital Energy Efficiency framework



# The IEA is focused on Stimulus & Clean Energy

---

## Upcoming analysis on energy efficiency and economic stimulus

- Transport behaviour changes during the Covid-19 crisis – What can past crises teach us?
- Utility programmes in energy efficiency and stimulus packages
- The role of cities in catalysing energy efficiency recovery efforts

## Smarter digital power infrastructure project

- 4-year project on digitalisation to enhance efficiency, resilient systems and energy transitions
- Focus on policy, regulatory and investment enabling frameworks
- Development of tools and guidance to test new policy approaches through pilot projects

## Upcoming events

- WEO Special Report on Sustainable Recovery – *June 19th*
- Global Commission for Urgent Action on Energy Efficiency – *June 22nd*
- IEA Global Conference on Energy Efficiency – *June 23rd*

iea