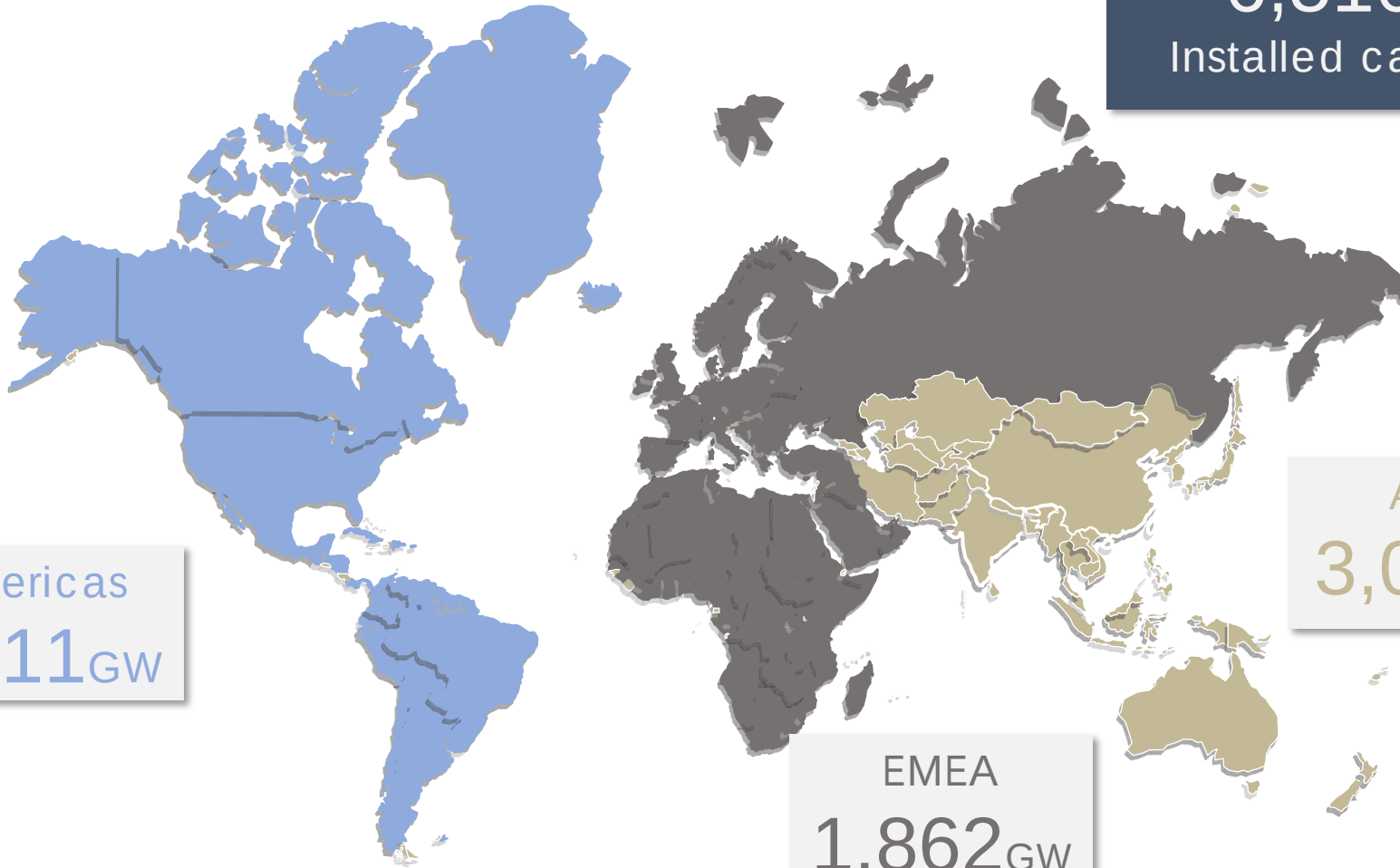
Asia Society Australia

Green India, Getting it Right

Pre-read for public webcast on May 19

Global installed power capacity (2017)

6,516GW
Installed capacity



Americas
1,611GW

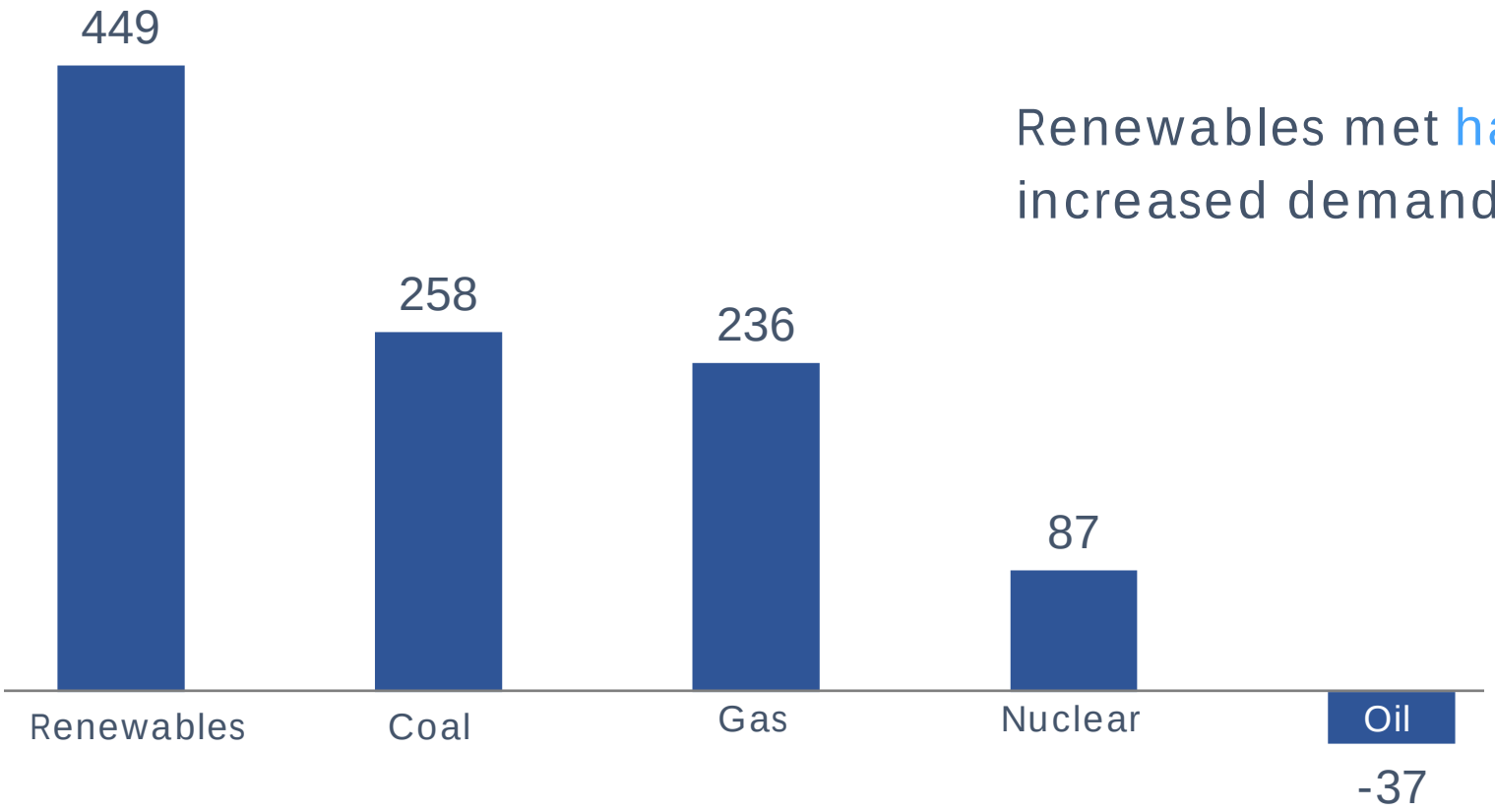
APAC
3,043GW

EMEA
1,862GW

Source: BNEF capacity & generation; IEA – global energy & Co2 report

Global electricity demand increased by 4% in 2018

Change in electricity generation by source 2017-2018 (in Twh)



Renewables met half of the increased demand (993 Twh)

Source: IEA – global energy & Co2 report

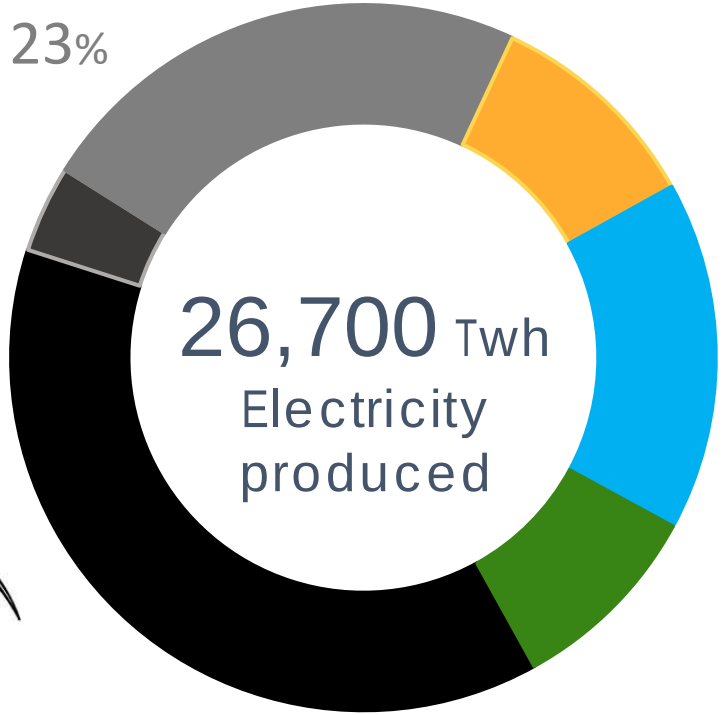

Still ~860m people dream access to electricity (2018)
India achieved 100% village electrification in 2018
Source: IEA

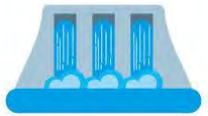
Fossils dominated electricity generation (2018)

Gas – 23%

Nuclear – 10%

Oil – 4%





Hydro – 16%

Coal – 38%

Renewables (all) – 9%

Source: IEA – global energy & Co2 report

But burning fossils **impacted adversely…**

2019 global Co_2 emission 33.3Gt

Power sector of advanced economies constitutes 36% of Energy related emissions

1.7% emission growth in 2018, highest since 2013

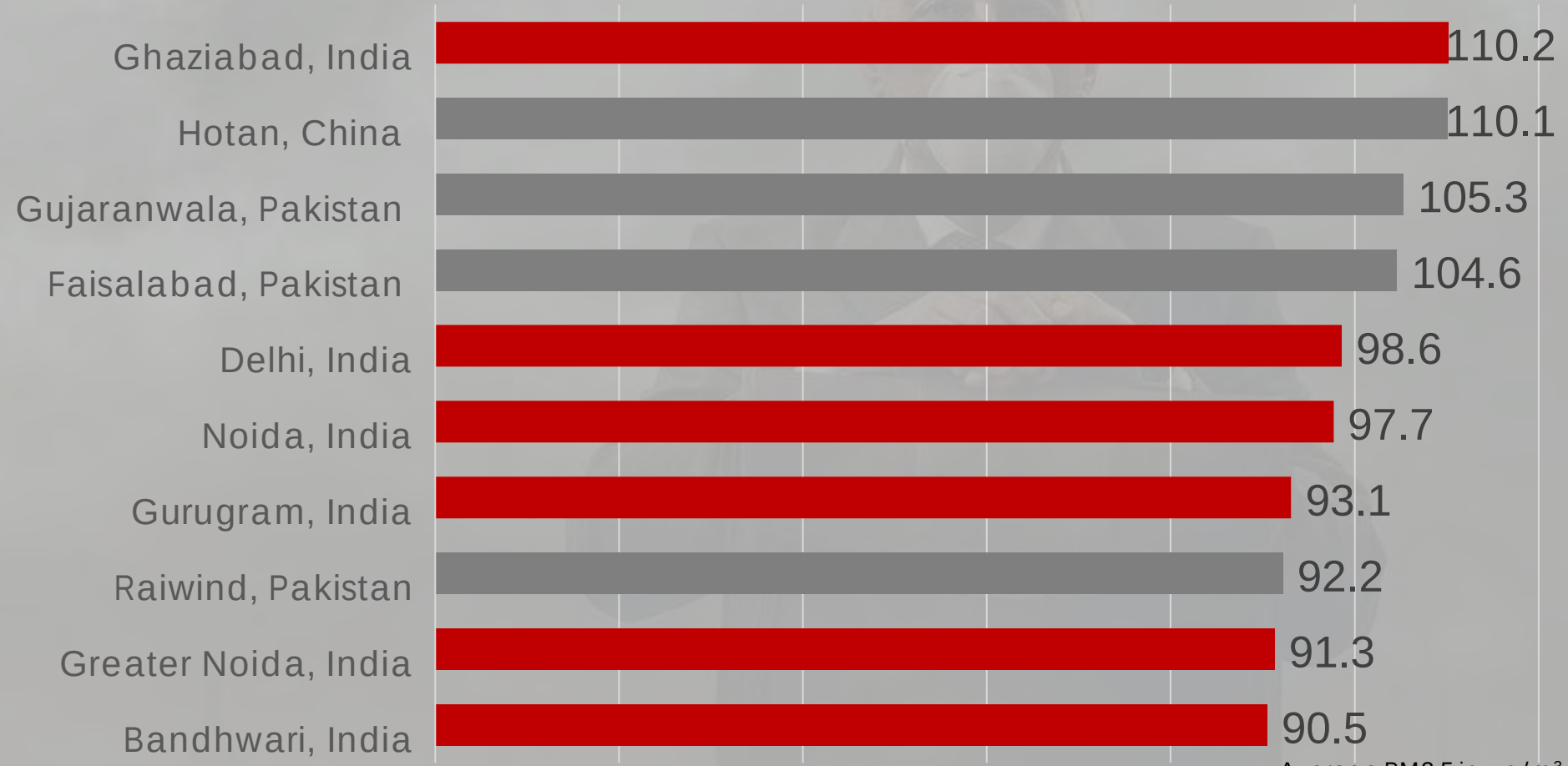
Source: IEA - emissions

This is leading to……

Polluted environment

Global warming

India has 6 of 10 most polluted cities (2019)



Source: IQAir

Global warming implications

19 of hottest 20 years occurred in last 2 decades

$ 320b global loss (2017)

140m climate migrants (2050)

Source: New climate economy 2018 report; NASA data

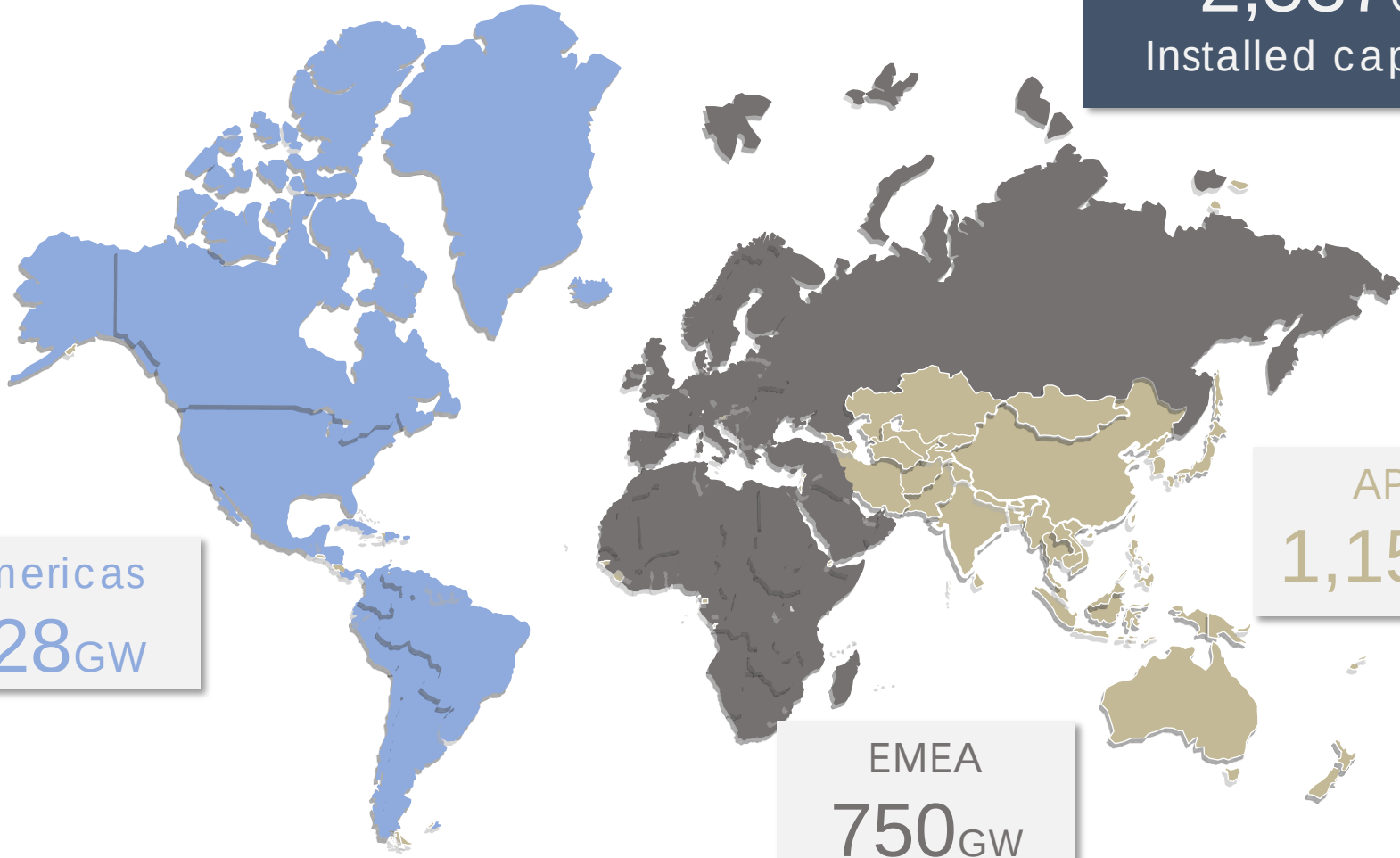
What is the solution?

Transformation to cleaner tomorrow

By implementing renewables……

Global installed RE (2019)

2,537GW
Installed capacity



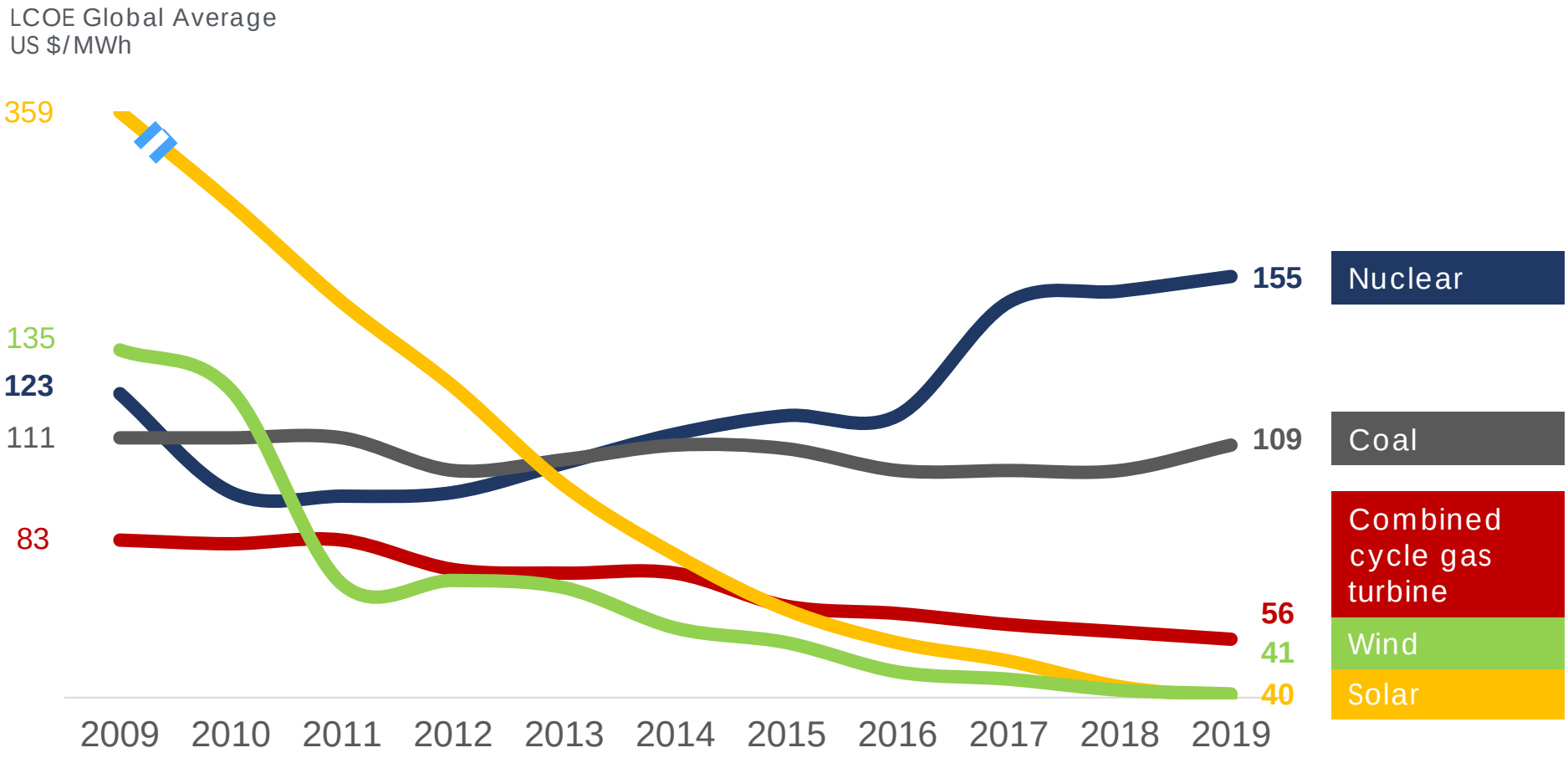
Americas
628GW

APAC
1,159GW

EMEA
750GW

Source: IRENA – Renewable capacity highlights

RE tariff surpassed conventional energy globally



Source: Lazard LCOE Analysis

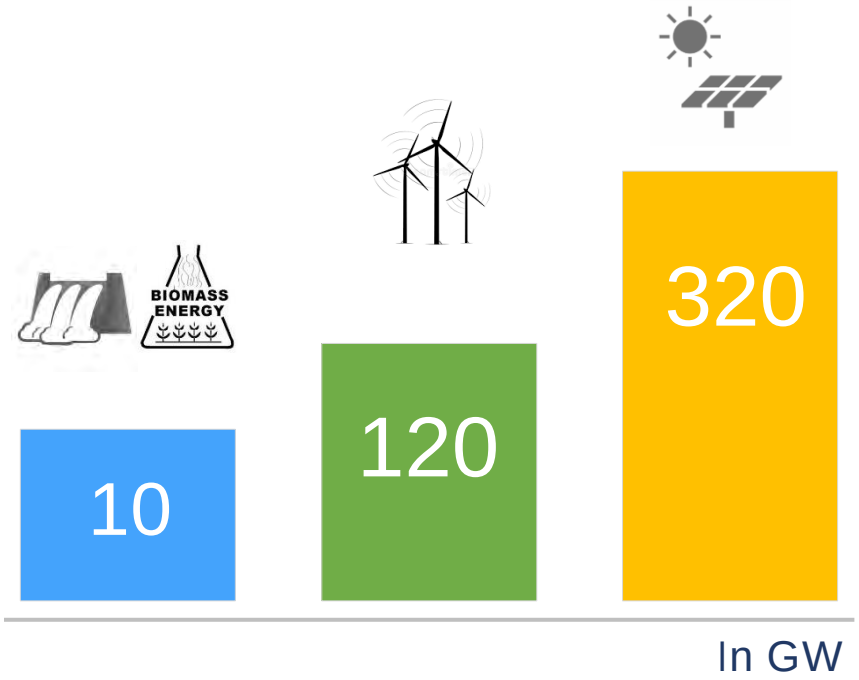
India's Paris commitment -2030

40% non fossil fuel share in electricity generation

35% reduction in emission intensity from 2005 level

Vision of Hon'ble Prime Minister of India

450GW by 2030



Sri Narendra Modi

"We must accept that if we have to overcome a serious challenge like climate change, then what we are doing at the moment is just not enough..... The time for talking is over. The world needs to act now....."

addressing the Climate Action

Source: *various articles, reports, industry information; assumptions*

International Solar Alliance

Collaborative platform of 122 Sun belt countries promoting solar energy for:

- enhanced energy security
- Achieve sustainable development

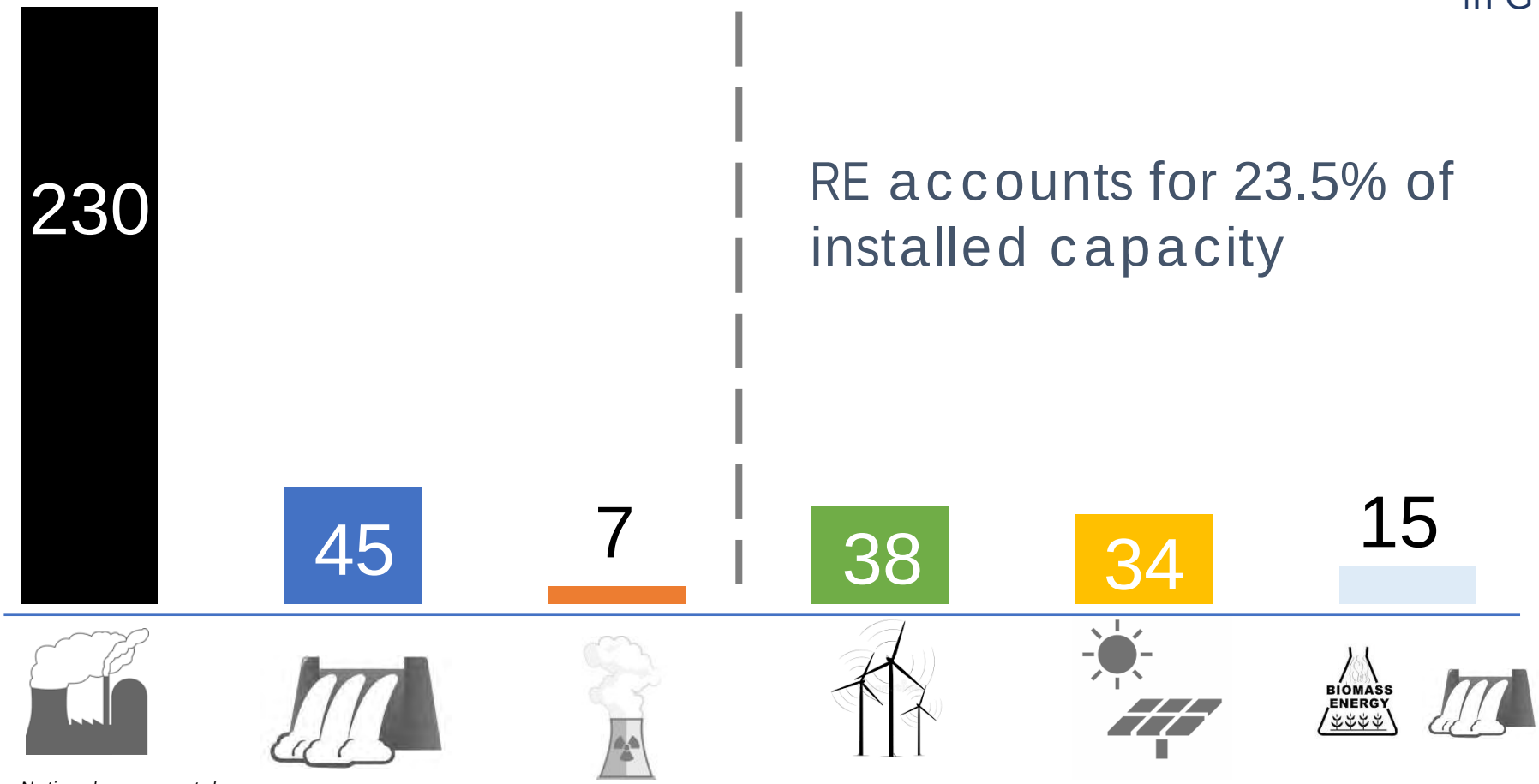
"We have a dream **One World, One Sun One Grid**. We generate round the clock electricity from Sun as it sets in one part of the world but rises in another part. Sun never sets for entire earth,"

Sri Narendra Modi at first assembly of ISA

Source: *ISA*

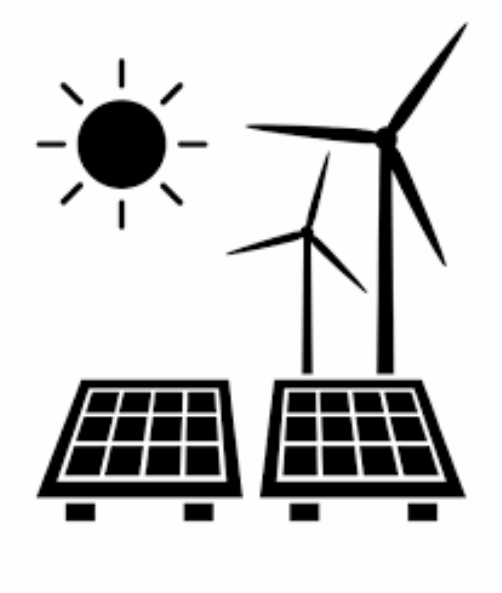
India's has ~87GW of installed RE capacity

In GW



Source: *National power portal*

$315b expected investment in RE sector by 2030



$290b

$25b

Source: Estimate

Indian RE sector challenges

Bid

- Non availability of quarterly bid plan
- Tariff ceilings
- Onerous financial charges on developer

Transmission

- Transmission capacity & RE project mismatch
- Pending 66.5 GW of transmission bidding
- New capacity plan for 450 GW RE connection

Land

- Single Window clearance
- Land ceiling in states
- Policy for allocation of waste land

Financing

- Priority sector lending
- Access to foreign bonds
- Timely DISCOM payments

Source: Industry discussion

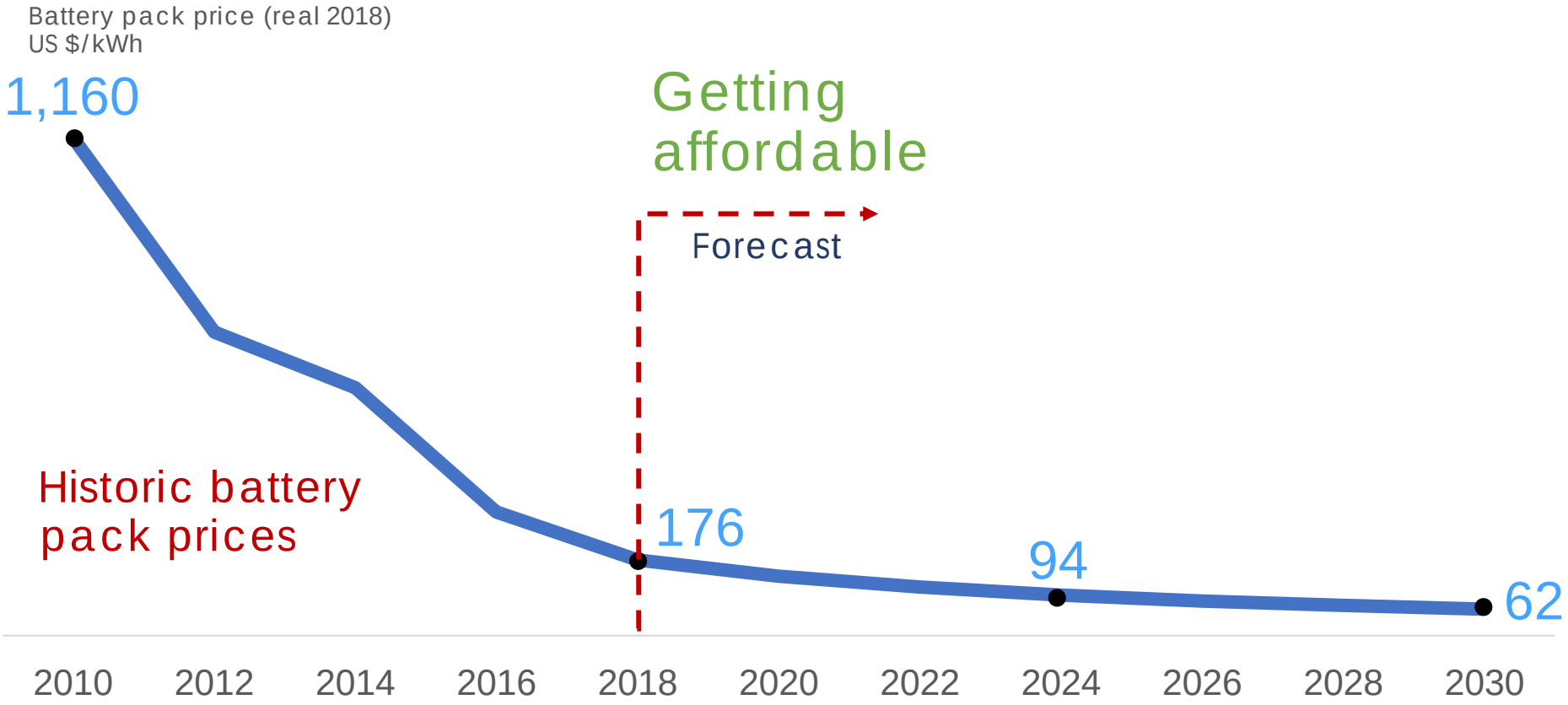
Essential technologies for 24x7 supply

Solar energy

Wind energy

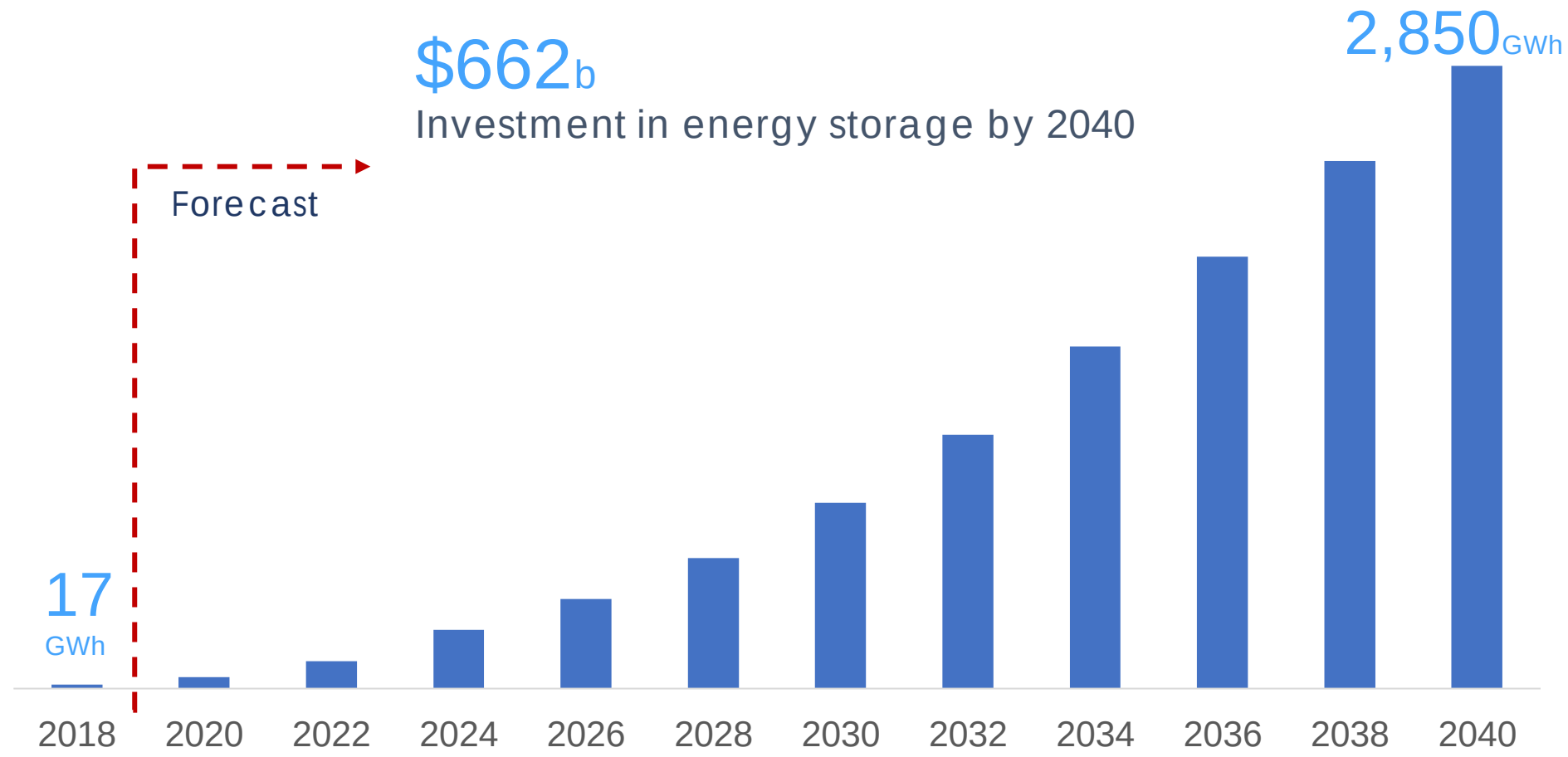
Storage battery
(ESS)

Exponential fall in storage battery price



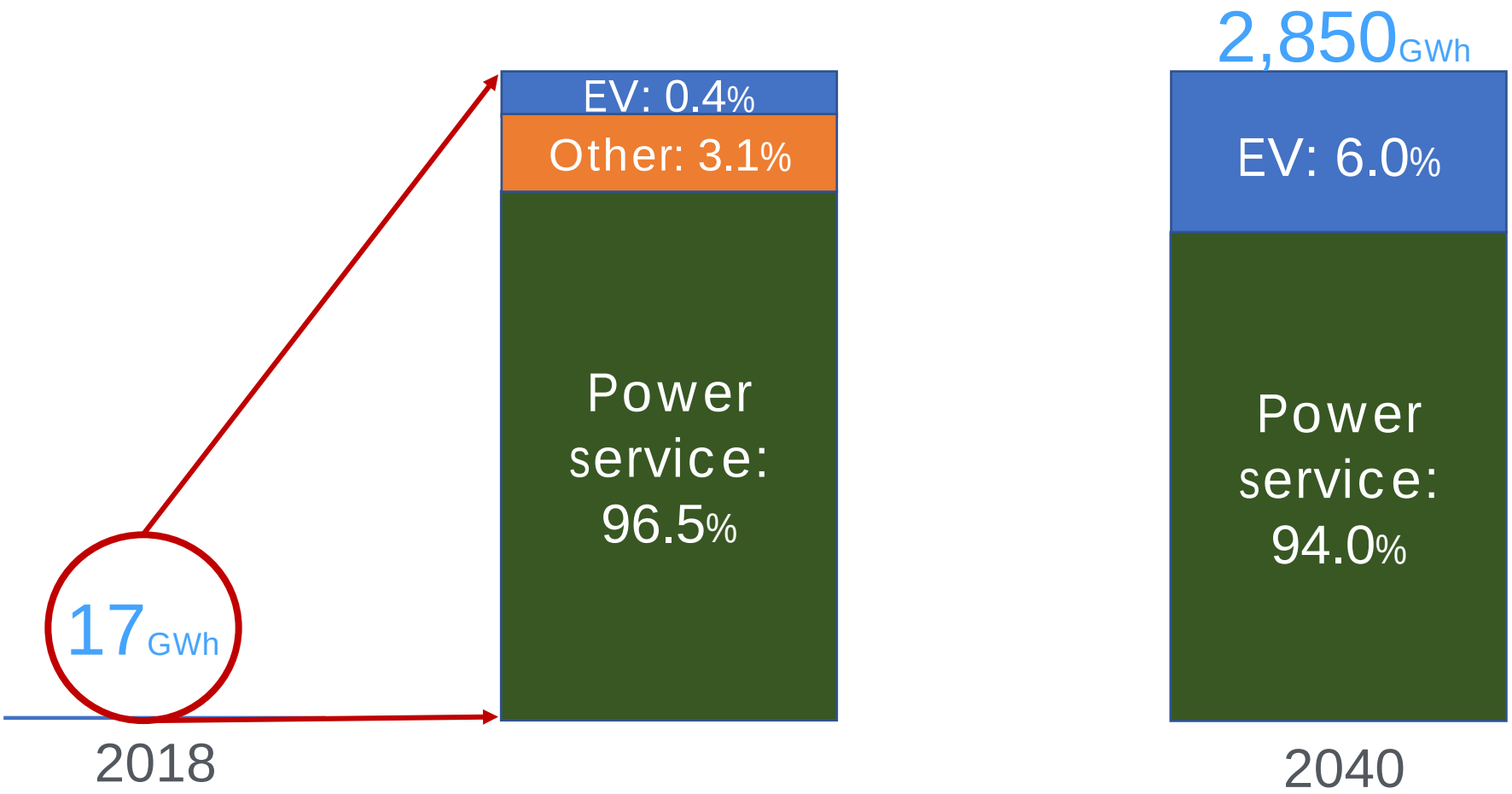
Source: BNEF

2,850GWh energy storage capacity (2040)



Source: BNEF

Power services to maximum utilize storage



Source: BNEF

Second major transformation globally

Steam engine

IC engine

Modern EV's

1769

1885

1936

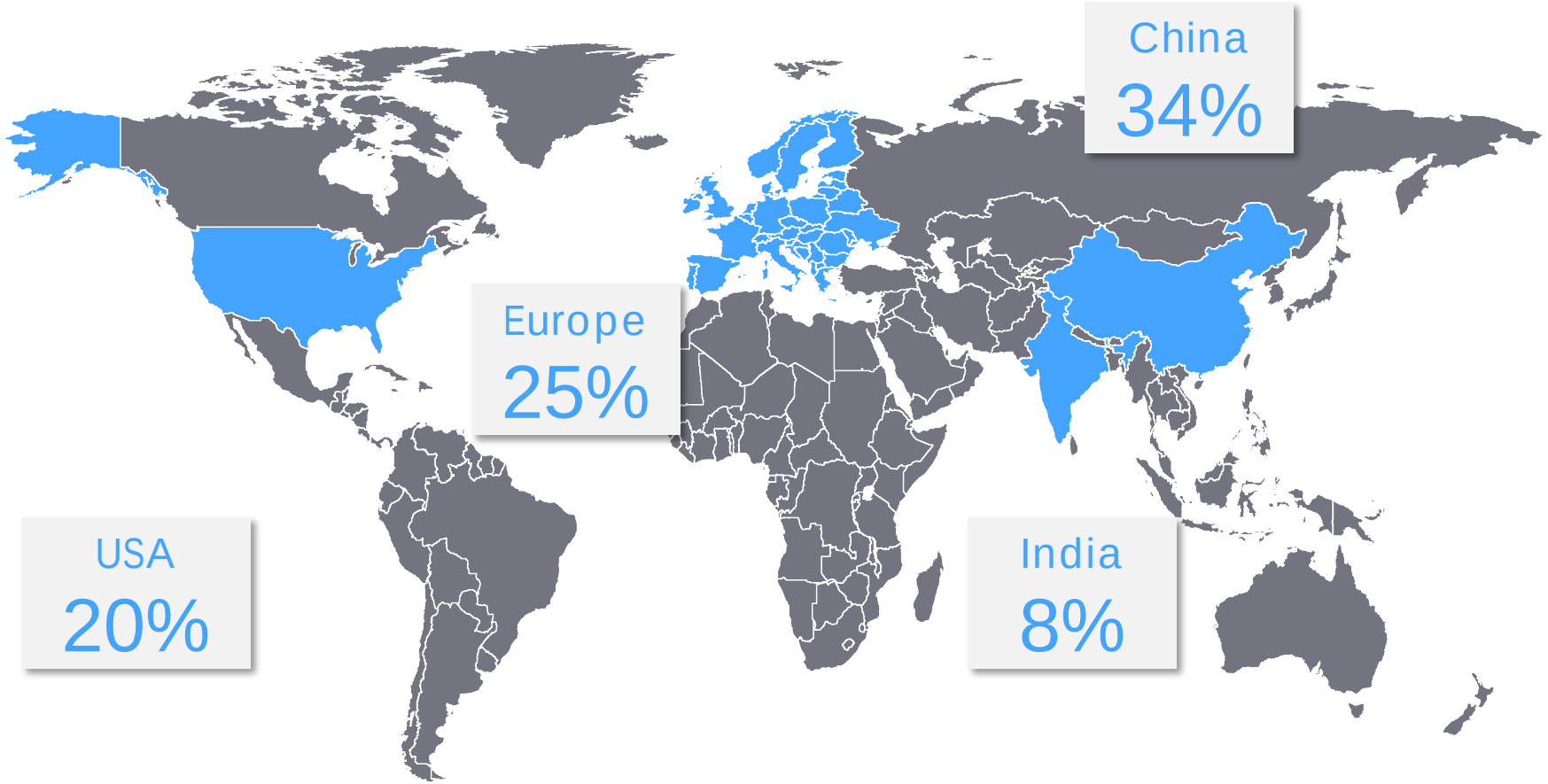
1997

2008

Diesel engine

Hybrid car

Top drivers of EV market (2030)



Source: BNEF EV outlook 2019

EV benefits

Environment friendly

New job creation

Low cost for drivers

Learnings from Indian RE sector

- Large RE vision
- Large scale projects
- Government backed PPAs
- Solar & Wind integration
- Solar park innovation

Thank You