



Infrastructure & Energy Transition

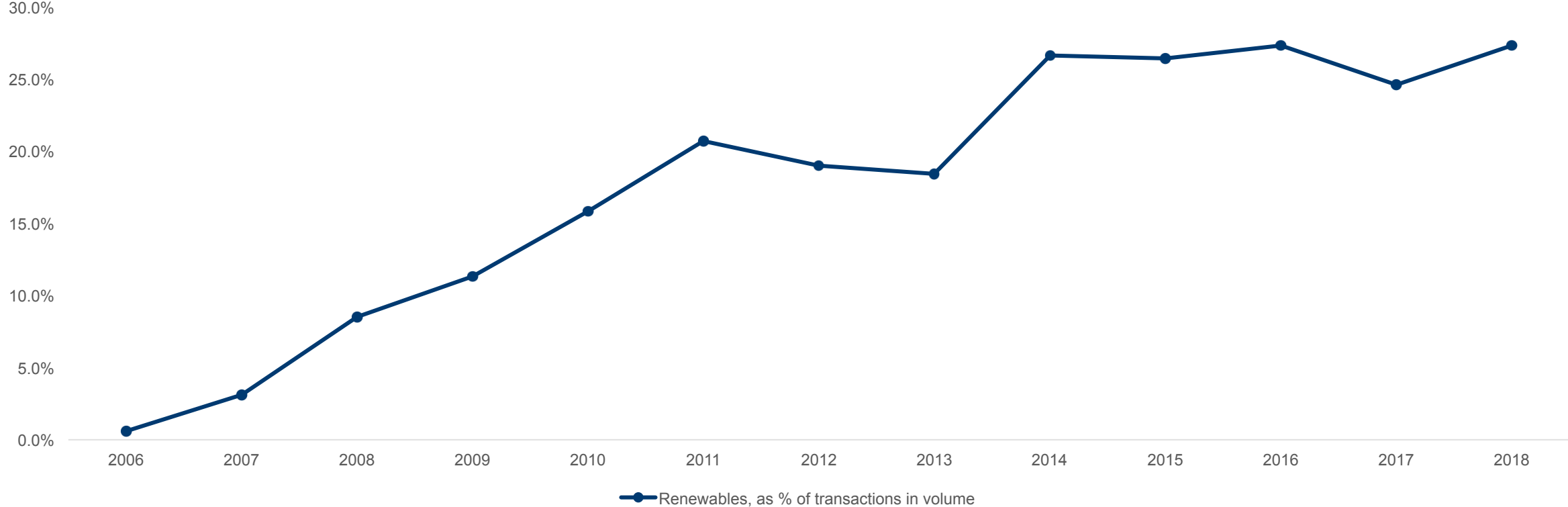
SchrodersX Sessions

Charles Dupont, Head of Infrastructure Finance

November 2019

Our world has changed

Energy transition becoming #1 investment theme in infrastructure, globally



Source: Inframation Group, November 2019

Renewable energy: an infrastructure profile ?

From CfD to PPA



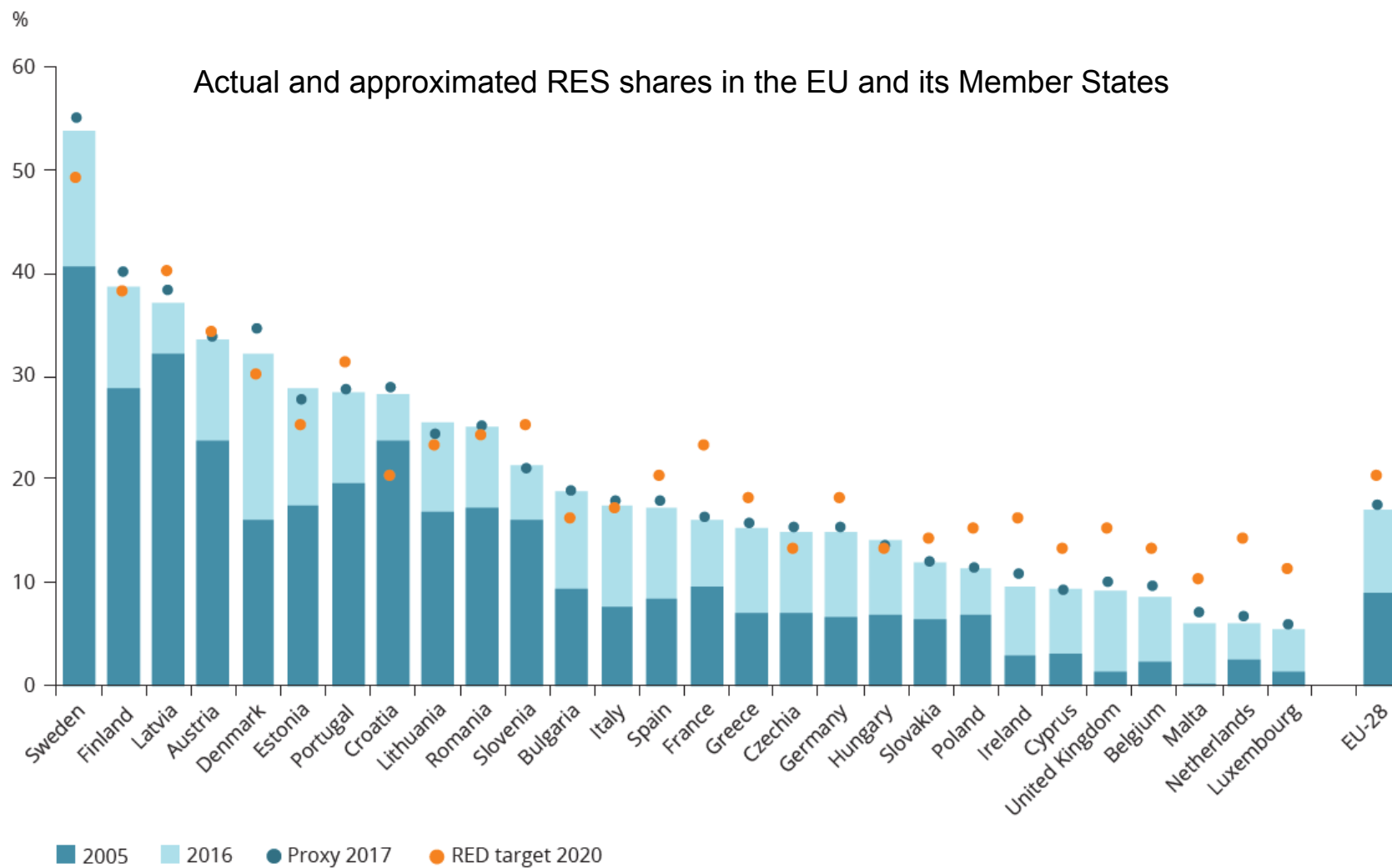
- FiT, CfD, RAB: financial mechanisms protecting returns for a certain period of time
- Market risk hedged with options or Power Purchase Agreement

Sovereign Risk vs Corporate Counterparty Risk

Visibility on future cash flow generation?

Source: Schroders, November 2019 – FiT, CfD, RAB, mean Feed in Tariff, Contract for Difference, Regulated Asset Base

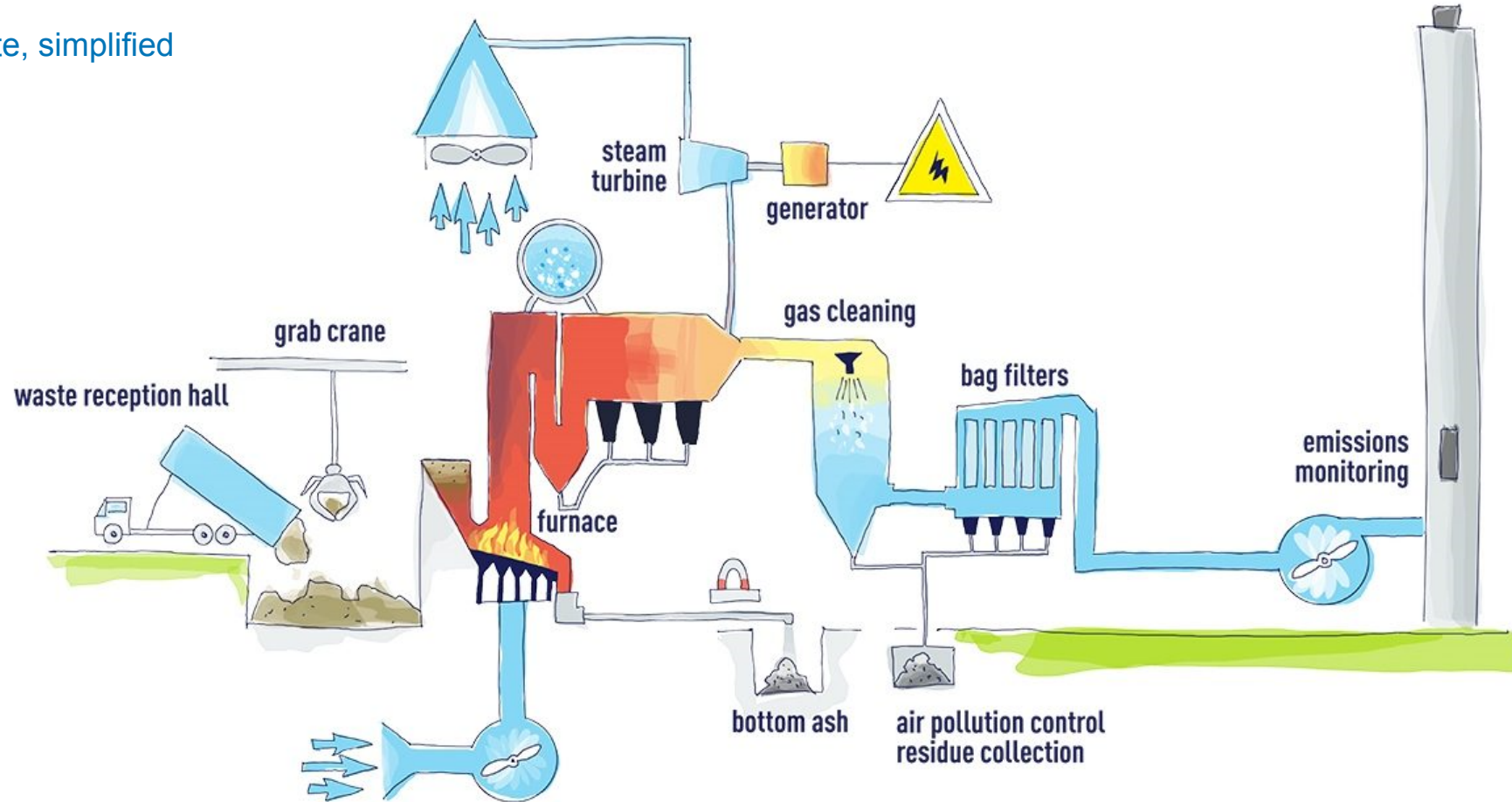
A growing place in the energy mix



Source: EEA, Renewable Energy in Europe, 2018 – RES means Renewable Energy Source

The power of waste

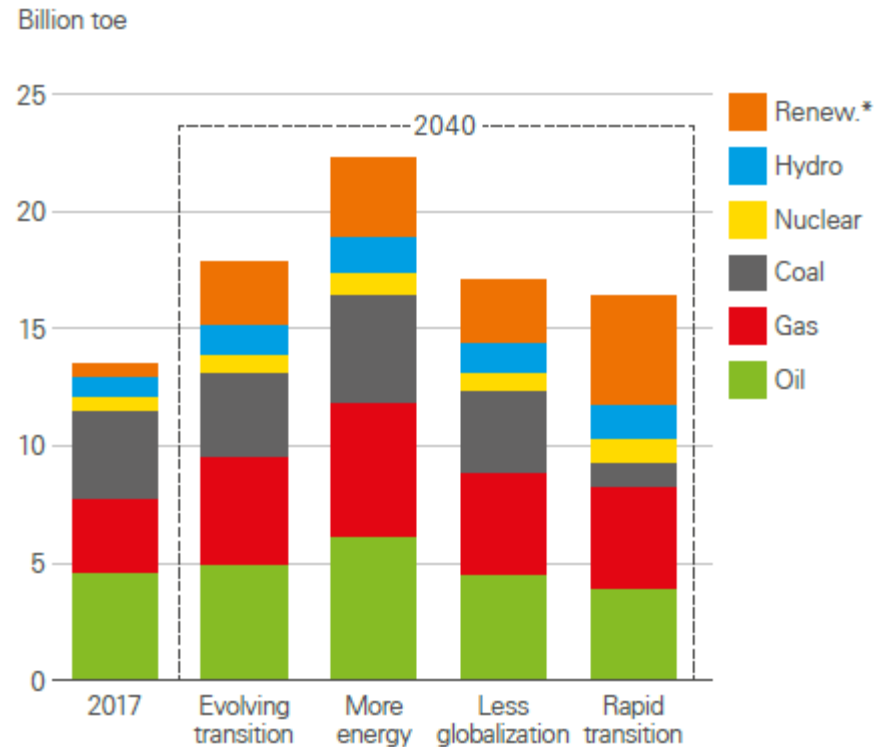
Energy from Waste, simplified industrial process



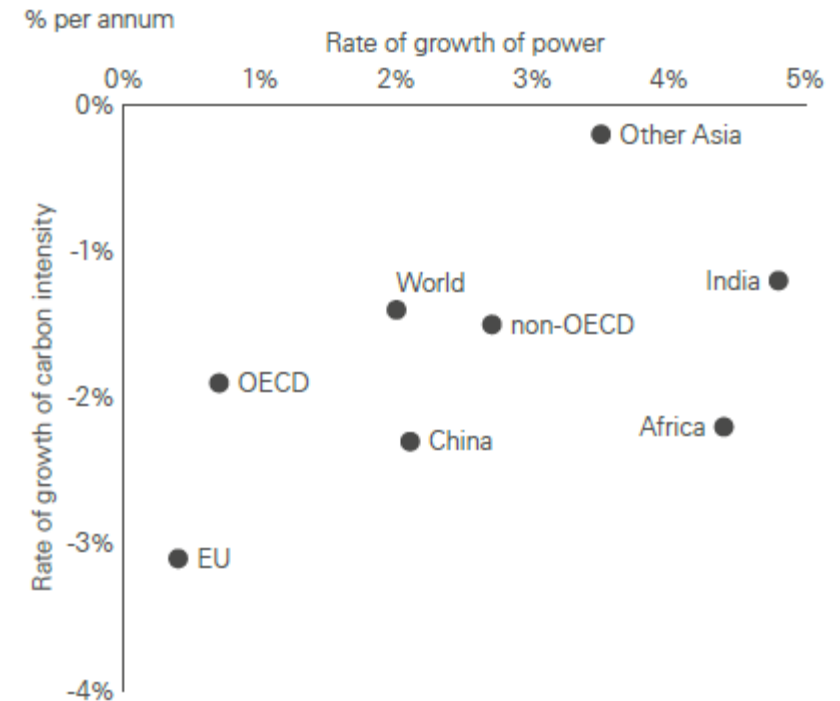
Source: Suez, how energy recovery works, www.suezcornwall.co.uk, November 2019

What to do with oil, gas and coal ?

Primary energy consumption by fuel BP
Energy outlook 2019



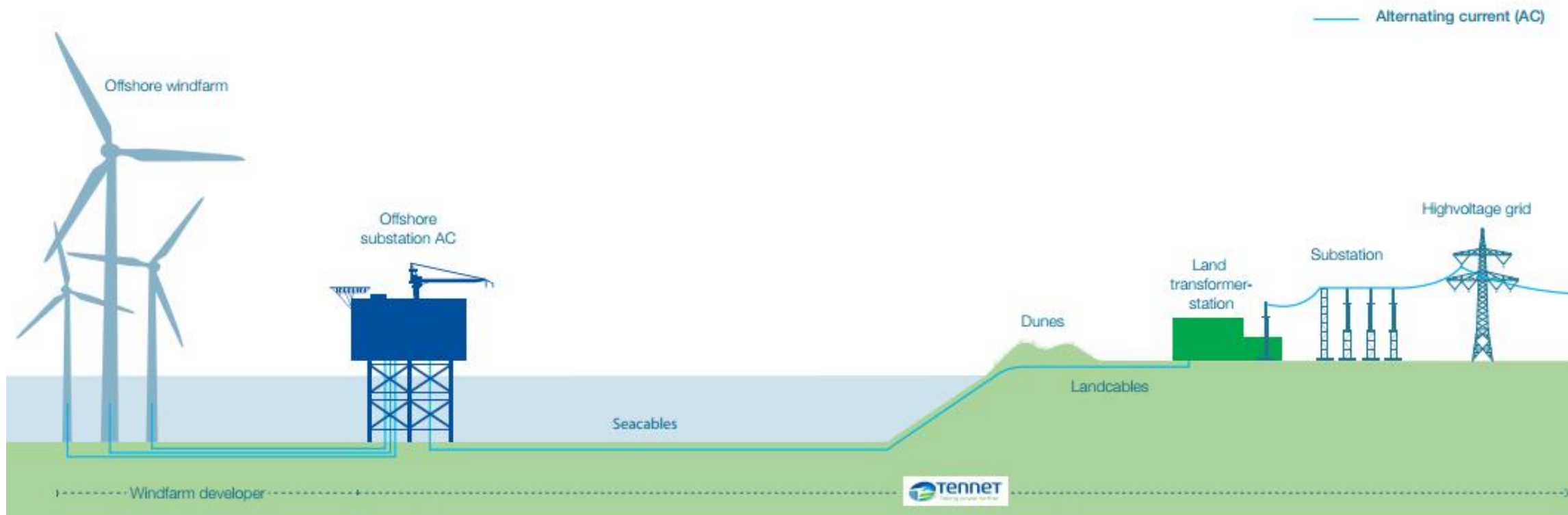
Growth in carbon intensity and power consumption, 2017-2040



The strong growth of power demand in developing economies helps renewables penetrate, but also creates demand for coal

Adapting infrastructure to new sources of power generation

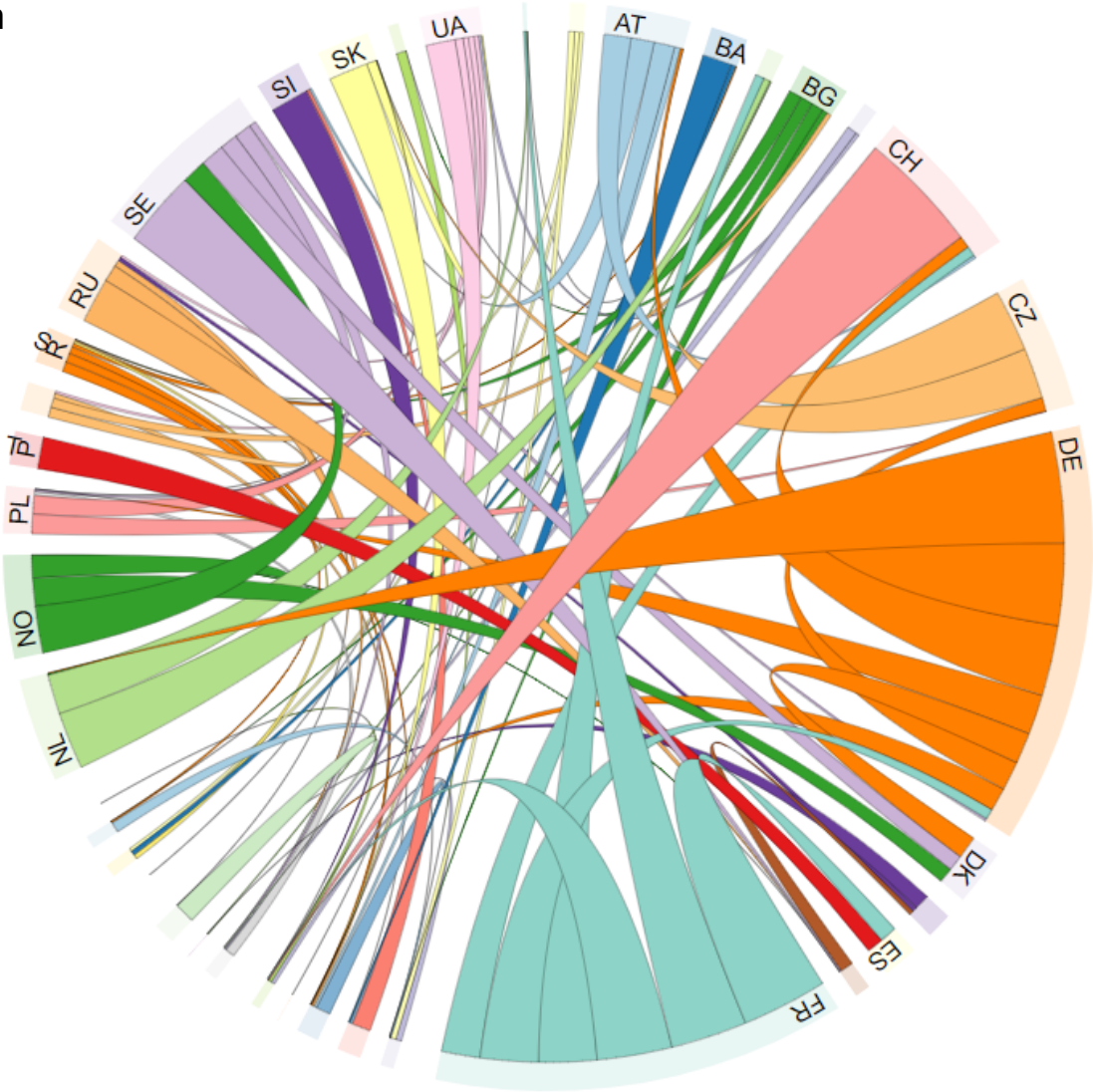
Offshore wind connection - schematic



Source: Tennet, November 2019

Managing intermittency

Energy exchanges between European countries in 2018

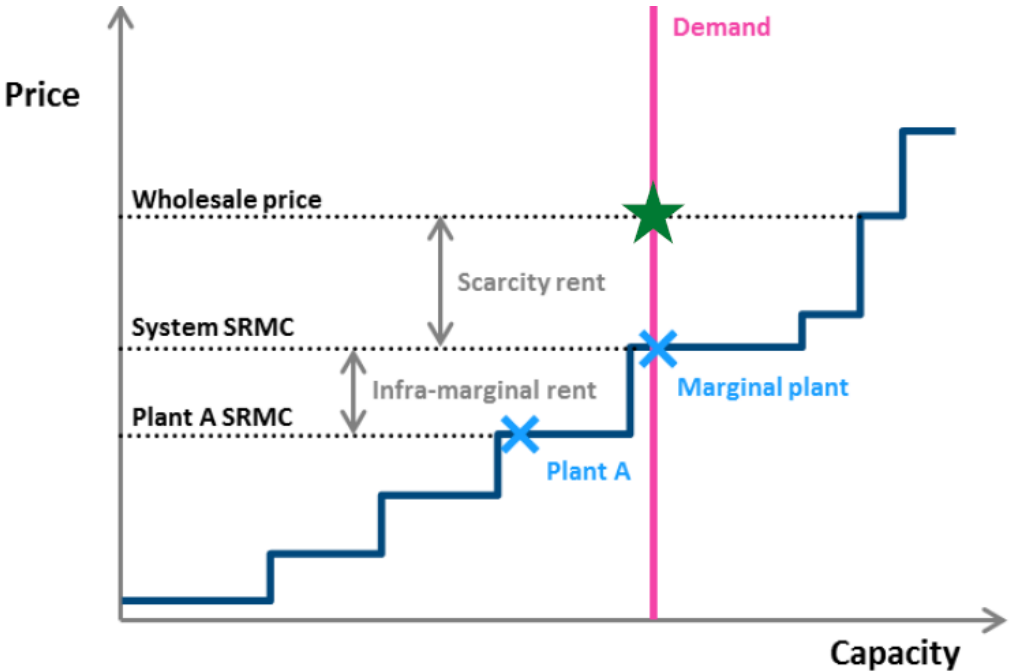


Source: www.energy-charts.de

Gas in the energy mix

Being high in the merit order

Intrinsic value of the CCGT



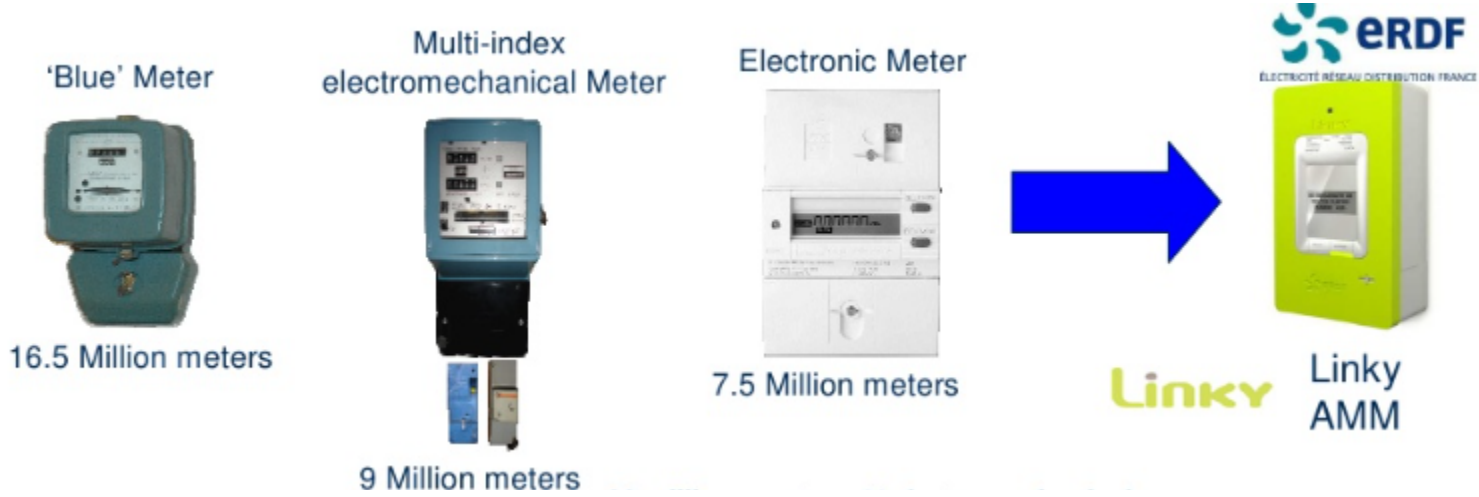
Extrinsic value of the CCGT



Source: Baringa,

New services, new infrastructures

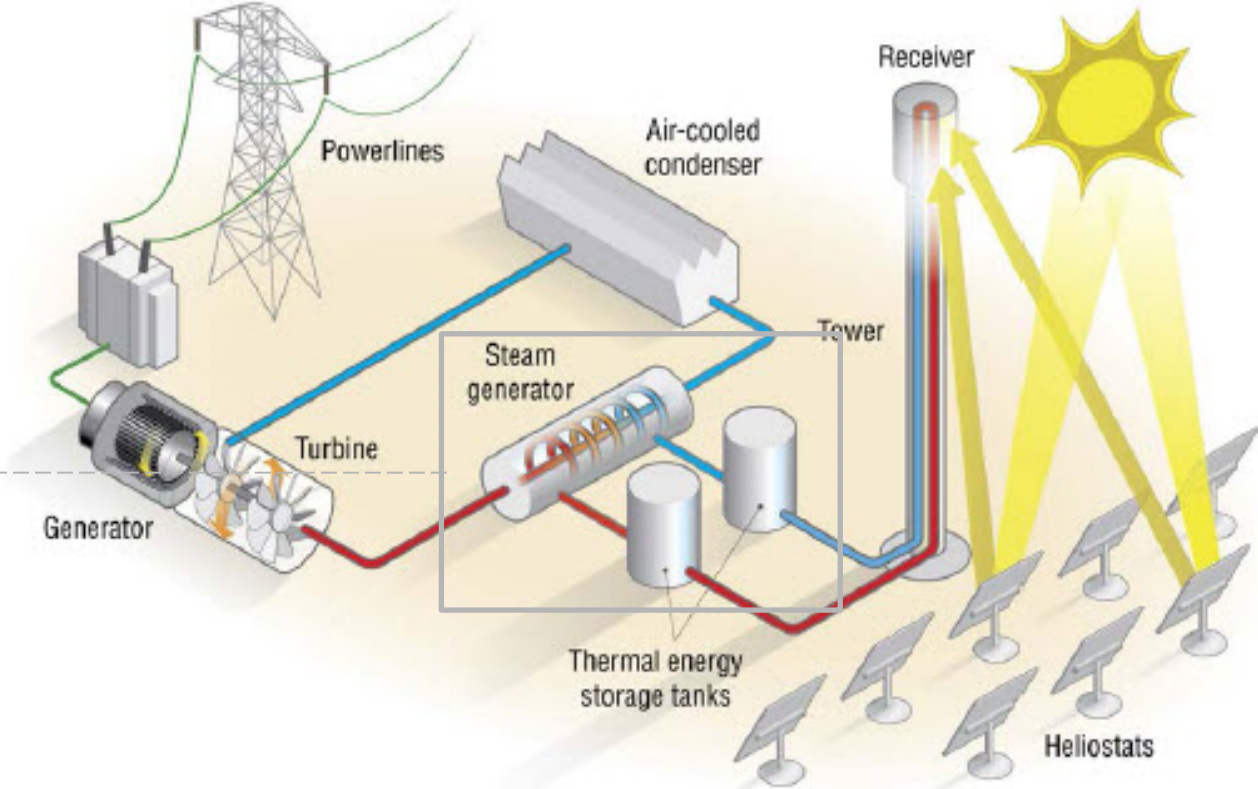
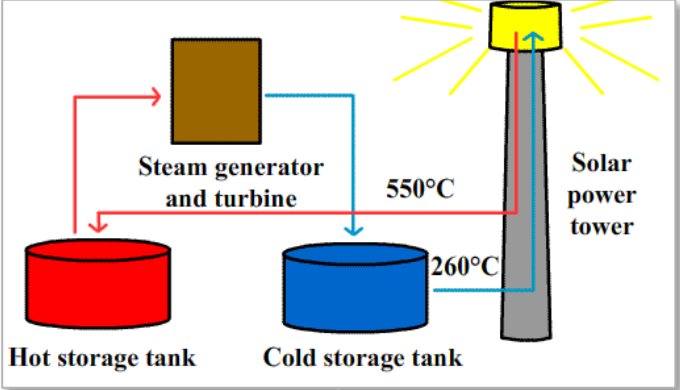
Smart metering: saving money, and more ?



Source: CRE, Electricity meters, French Status, 2018

Storage as a new infrastructure

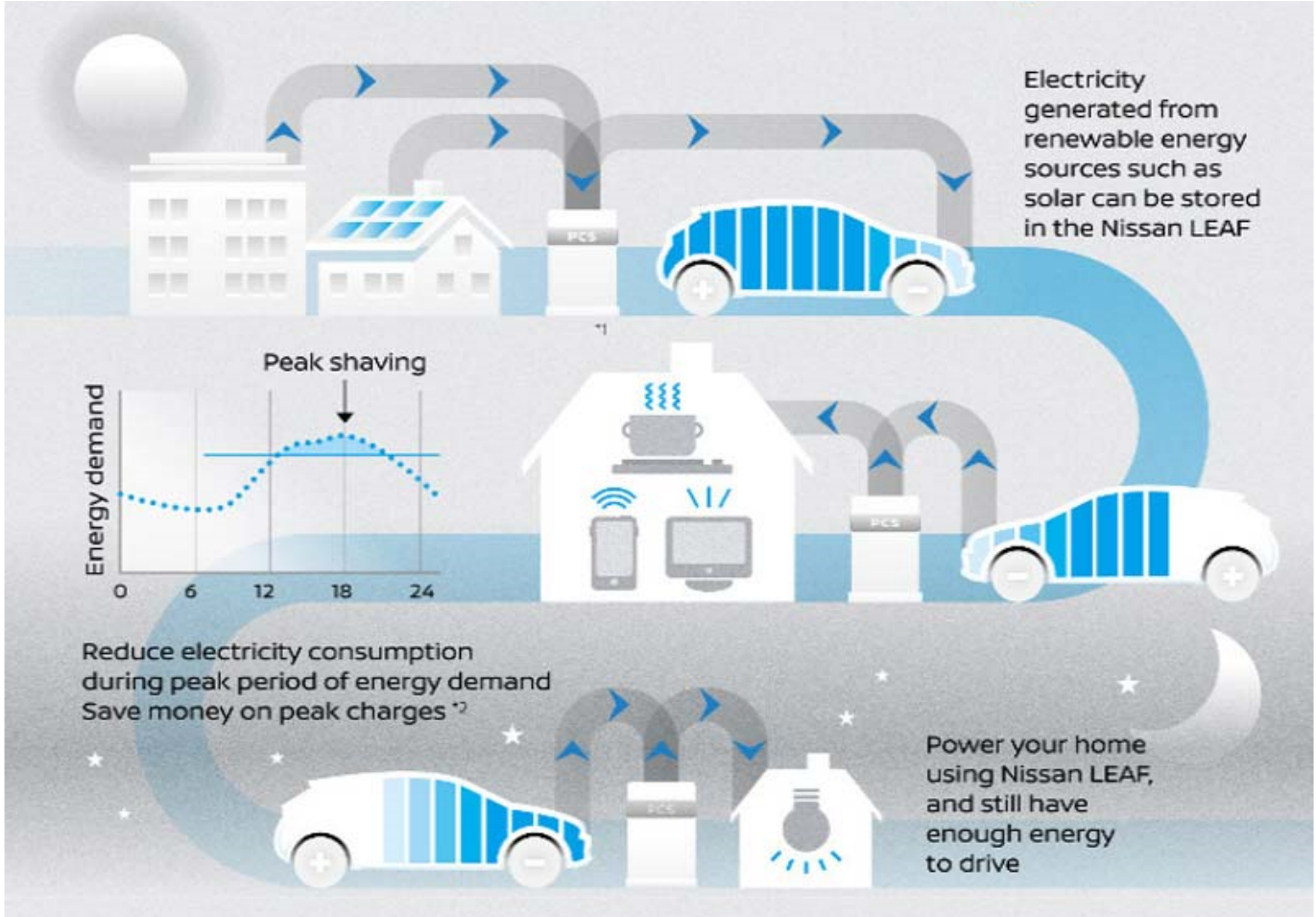
Molten Salt Concept



Source: Solar Thermal Energy Storage Systems, Christopher Barile, November 2010, Stanford University

Cars as a new utility ?

Vehicle to Home/ Vehicle to Building Concept



Source: Nissan Energy Share, 2018 - Vehicle to Home/ Vehicle to Building Concept

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