International Energy Agency

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INTERNATIONAL LOW-CARBON ENERGY TECHNOLOGY PLATFORM

IEA Insights Paper

Enabling Deployment of Renewable Energy and Energy Efficiency Technologies

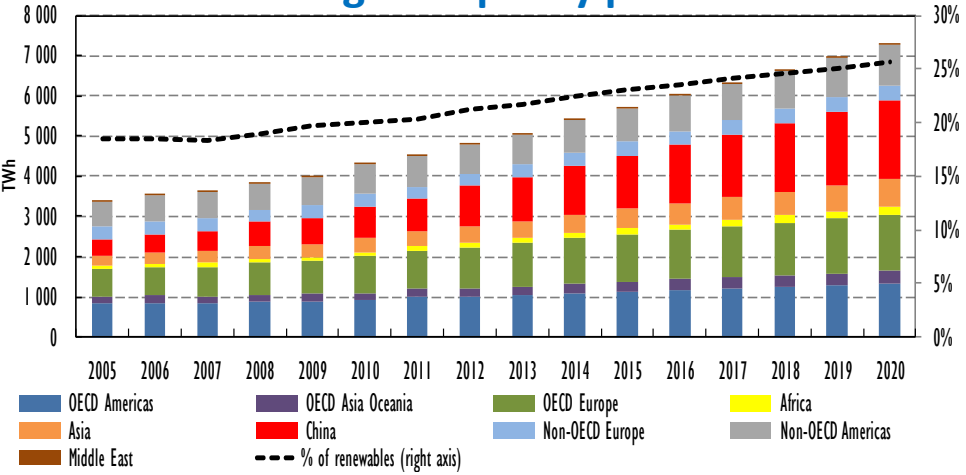
Regional Focus: ETC and SEMED

June, 2015

www.iea.org

Renewable electricity

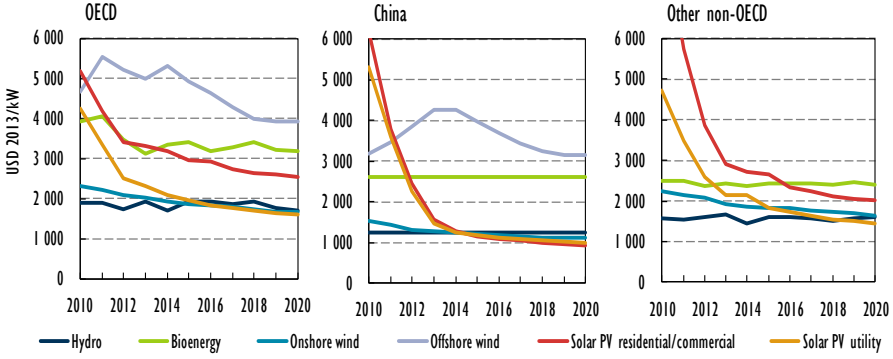
Growing maturity and cost reductions for wind and solar change the policy priorities



Above: Global renewable electricity production by region, historical and projected

2013	Total RE TWh	Non Hydro RE TWh
World	5068	1240
SEMED	15	3.4
ETC	60	0.3

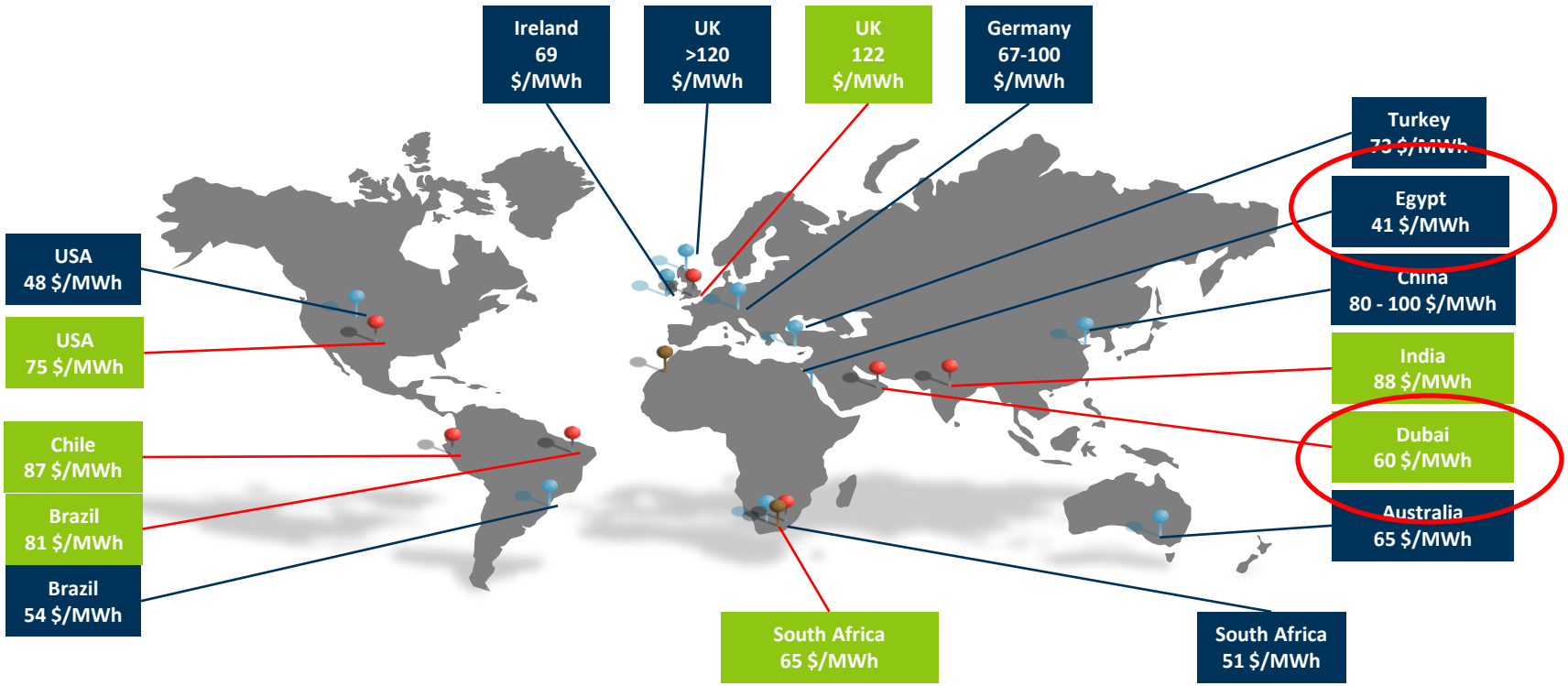
- High levels of financial support no longer required if **resource** and **appropriate market** and **regulatory framework** in place (affects system prices and financing)
- So, the focus of policies should **shift away from economic incentives towards creating the right conditions**



Above: Weighted average annual renewable investment costs, historical and projected

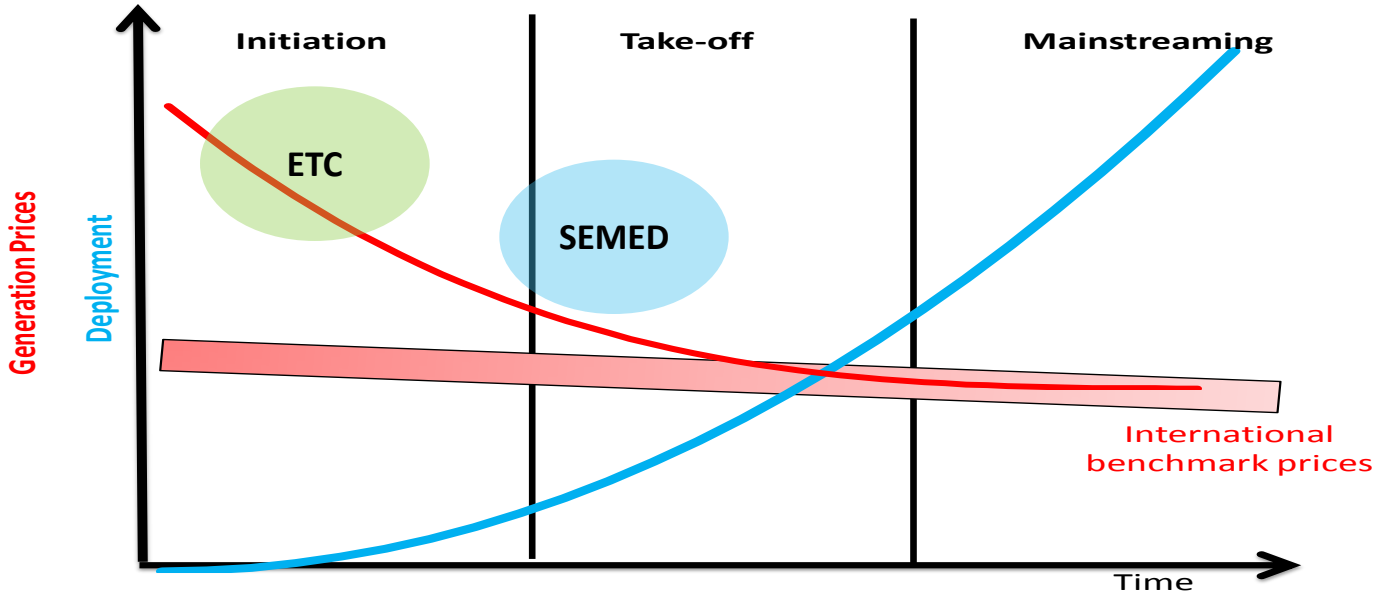
Recent long-term remuneration contract prices (e.g. auctions and FITs)

Onshore wind Utility PV



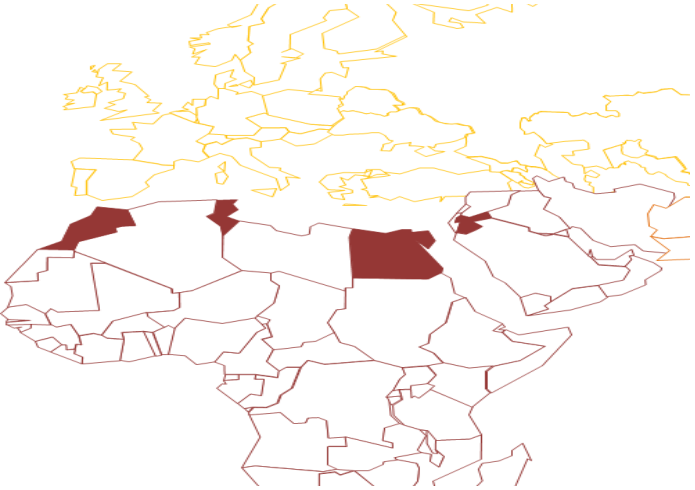
Possible to "leapfrog" to low cost renewables where good resource and appropriate policy and regulatory framework are in place

Changing Policy Priorities



Key Objective	Critical Mass	Reduce Costs	System Integration
KEY PRIORITIES	Clear regulatory framework	Cost convergence with international benchmarks	Develop flexible system
	Secure financial support	Introduce competition	Market reform

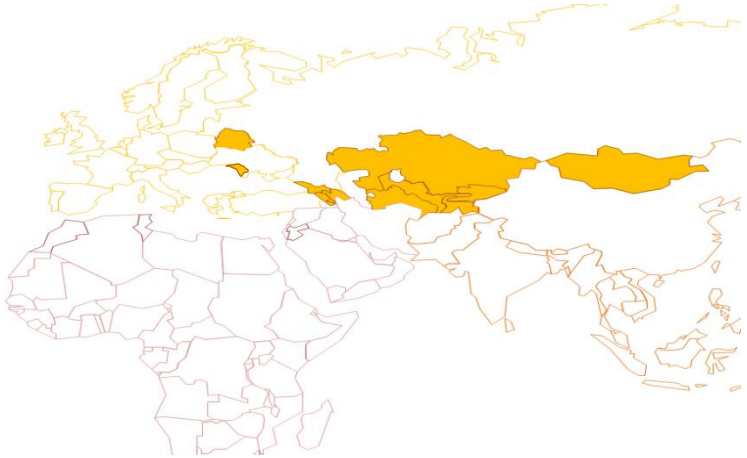
SEMED region



- **Strong drivers**
  - Significant solar and wind capacity
  - Sample countries net fossil fuel importers
- **Renewables taking off**
  - Recent considerable strides in RE targets and regulatory measures
  - Accelerated deployment and take-off expected
- **Conditions for increased market penetration of RE&EE are ripe**

Note: these maps are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

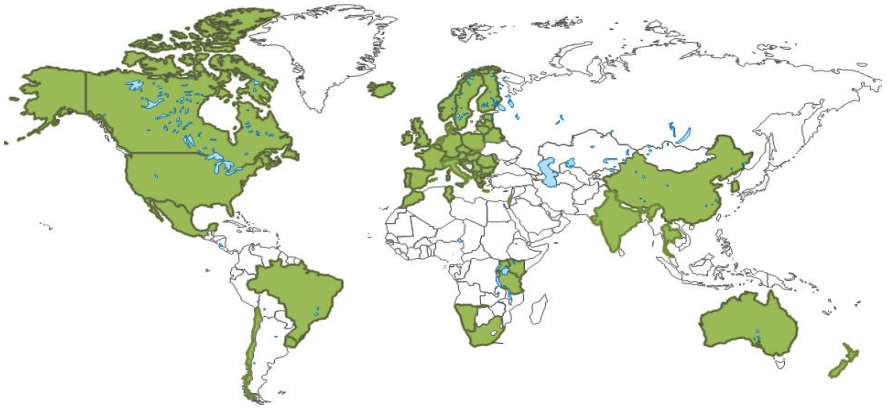
ETC region



- **Growing interest and strong potential**
  - most countries have declared RE targets for 2020
- **Contribution of non-hydro renewables remains marginal**
- **Ongoing barriers that hinder deployment schemes**
  - Need for legal, regulatory and financial mechanisms
  - Absence of secondary legislation
  - Need for clear and enforceable guidelines for grid access and integration

RE heat generation

Suffers from lack of policy attention



Above: Countries with targets and support policies for renewable heat

Heat Policies	
SEMED	Morocco, Tunisia (Solar)
ETC	Belarus

- Technologies are **mature** and **cost-competitive** in best cases
- Needs **portfolio of measures** to address **economic barriers** and **encourage cost reduction** and also **tackle other barriers** (skills, information, standards)
- **Sector-specific efforts**
  - Industry: stimulate the market by implementing fiscal incentives; fostering co-generation, direct low- medium-temperature process heat, developing supply chains
  - Buildings: integrated and **carefully coordinated with EE measures** including building codes and standards

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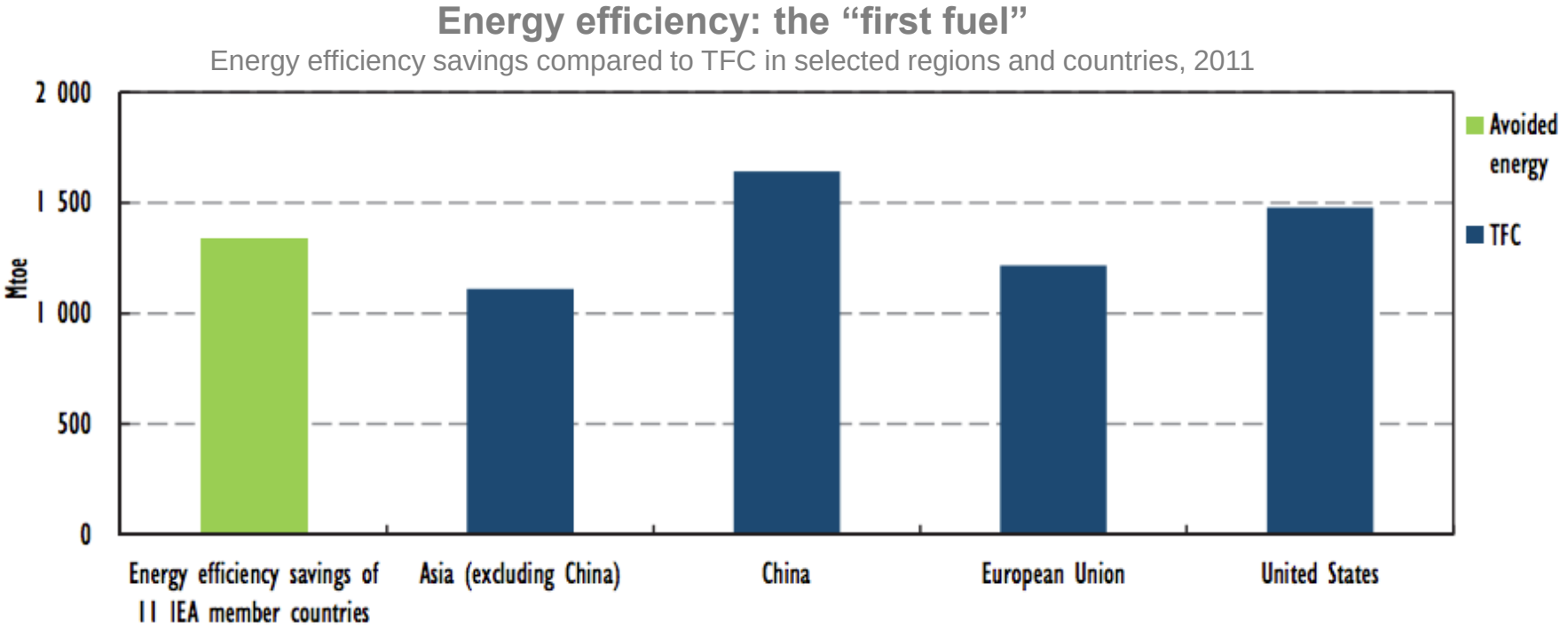
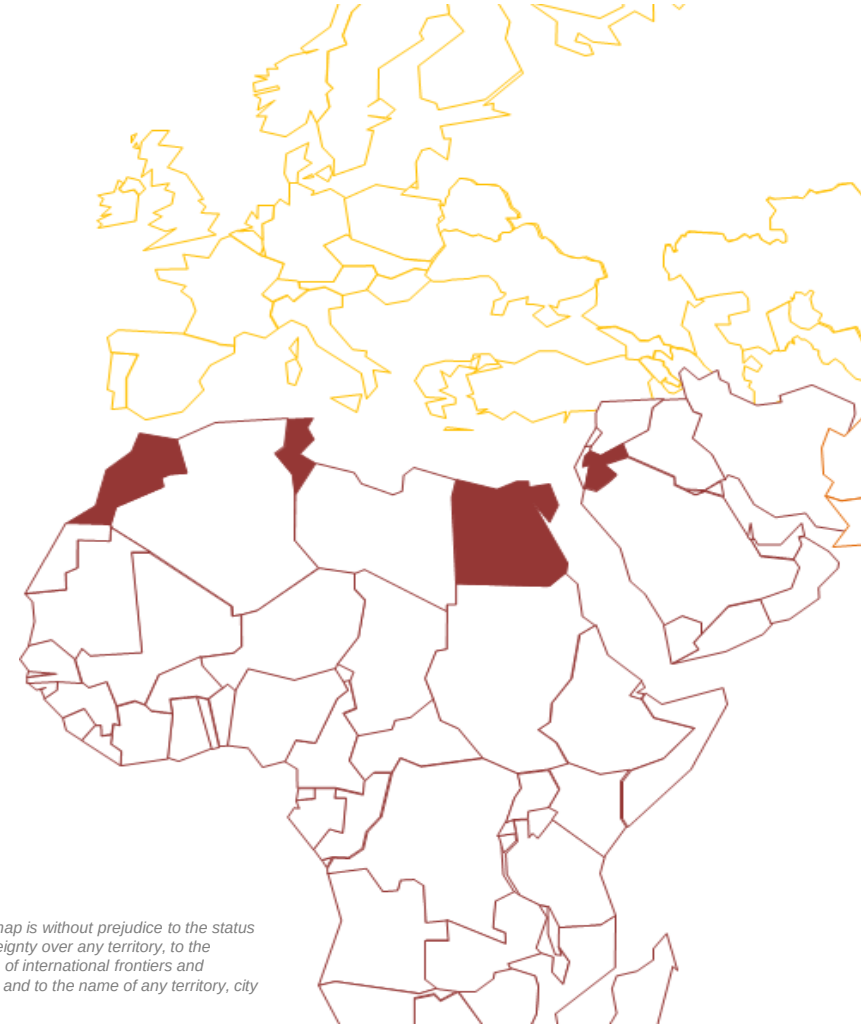
Energy efficiency



- **Solid foundation to promote EE:**
  - Cross-cutting national energy efficiency plan with measurable targets
  - Adequate resourced agency responsible for implementation and monitoring
  - Promote funding and incentive mechanisms
  - Raise awareness of EE benefits

Energy efficiency in the SEMED region

- **Opportunities for energy savings**
  - Transport, building space conditioning, lighting, and others
  - Strong drivers in importing countries
- **Barriers**
  - Lack of specific energy efficiency targets and ability to monitor progress
  - Lack of dedicated agencies to coordinate end-use data collection



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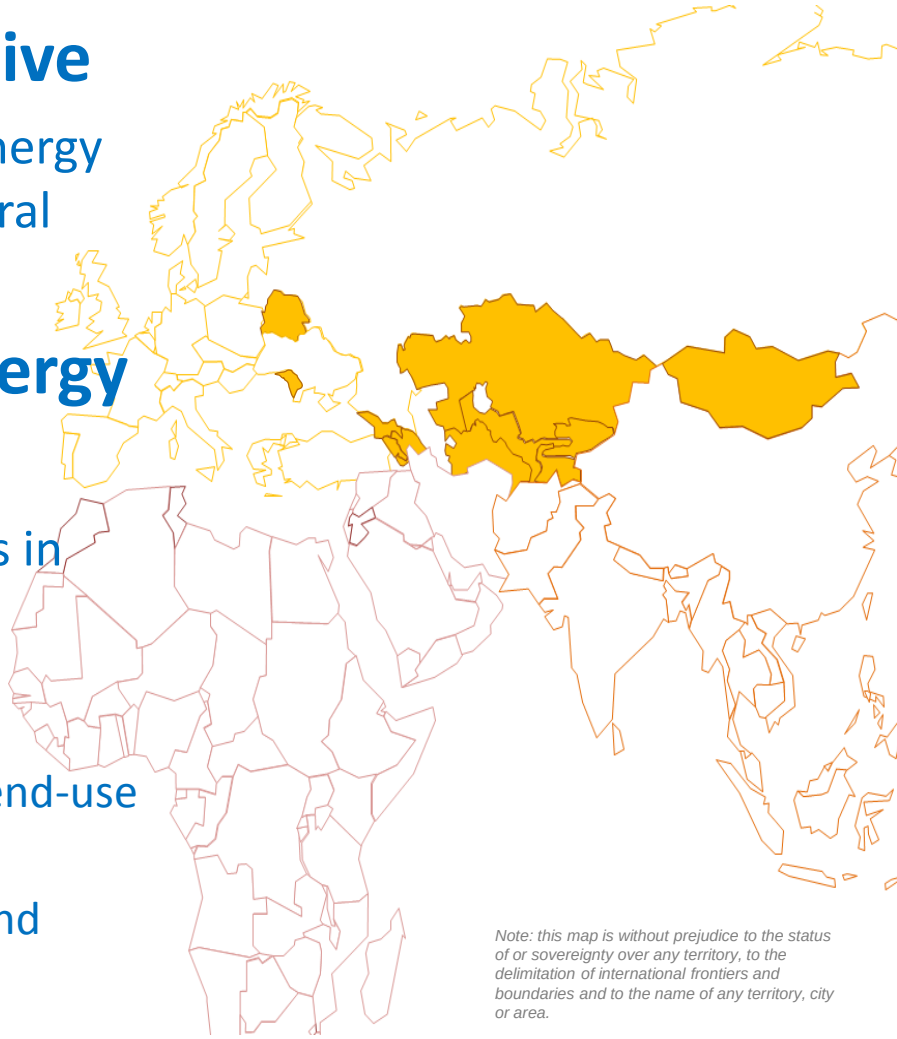
Energy efficiency in the ETC region

- **Remains highly energy-intensive**
  - Continuing inefficiencies in the way energy is used, as well as climatic and structural economic factors
- **Considerable potential for energy savings in all sectors**
  - District heating, industry and buildings in particular
- **Barriers**
  - Lack of dedicated agencies to coordinate end-use data collection
  - Lack of specific energy efficiency targets and ability to monitor progress



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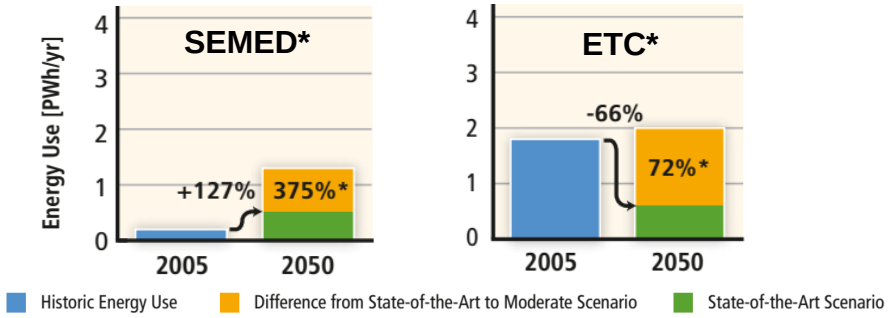
EE opportunities in buildings

- **Heating and cooling** energy intensity reductions through **building codes, retrofits** and **building certification** schemes supported by **resourced compliance systems**

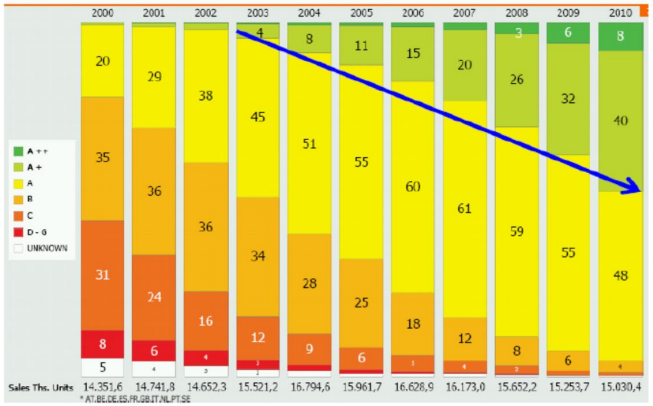
- **More efficient appliances and lighting** through **labelling systems** supported by a **compliance system**

Potential to reduce final energy use for space heating & cooling through energy efficiency



*representative potentials drawn from MNA and FSU regions from IPCC (2014)

Efficient appliance market share in the EU

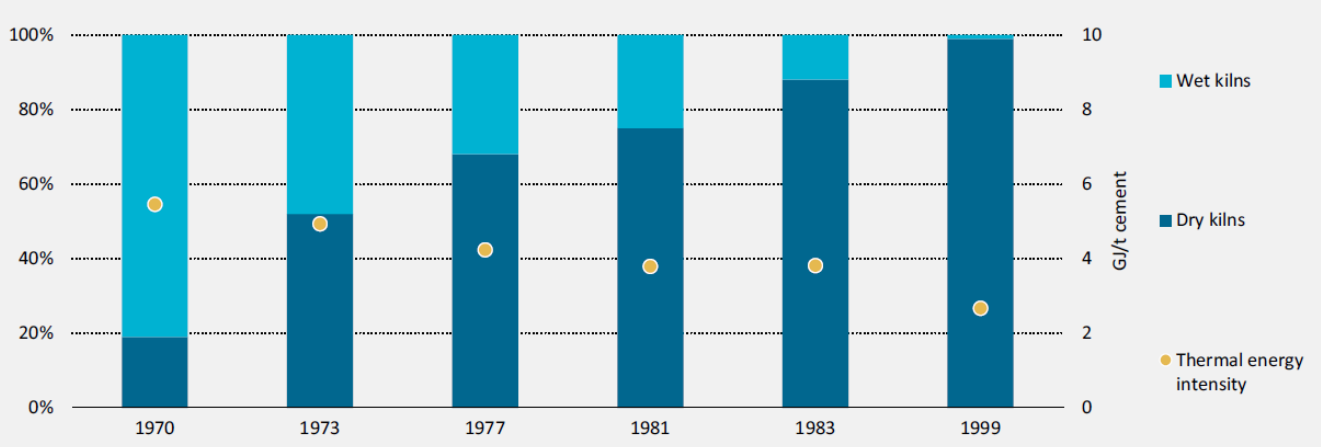


Source: www.come-on-labels.eu For selected number of European Union member countries

EE opportunities in industry

- **Energy audit programs** for industrial plants identify **technology** and **training investment opportunities**
- **Efficiency standards for cross-cutting technologies** (e.g., motors, pumps, boilers) enable broad reach
- **Energy management standards** (e.g., ISO 50001) promote energy indicators and continuous improvement

U.S. DOE Industrial Assessment Centers Audit Program



Source: SNIC (2014), personal communication.

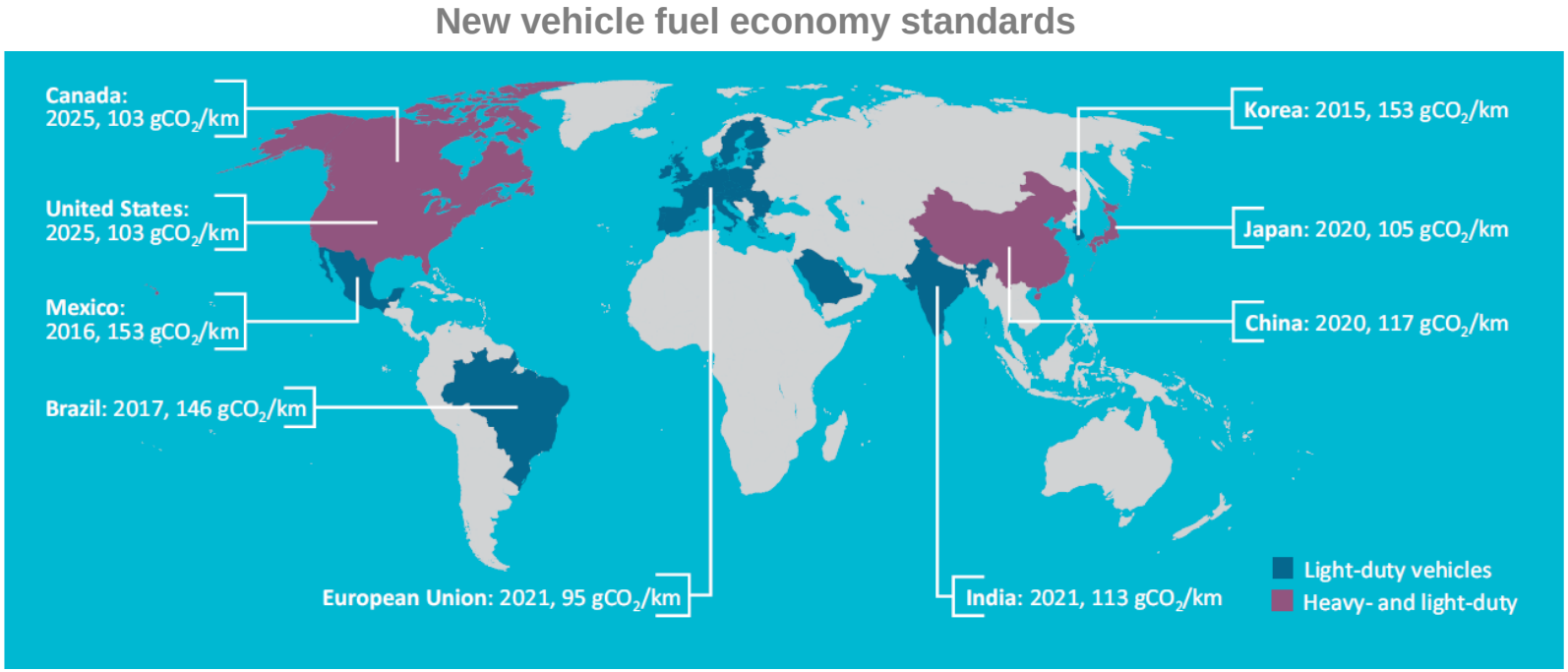
Cement kiln process transition and energy intensity impact in Brazil

Source: IEA 2015

EE opportunities in transport

- **Mandatory vehicle efficiency standards** and **fuel economy labeling programs** facilitate continuous fleet efficiency improvements

- **Consumer awareness** and **incentives** for **modal and behavioral shifts** to reduce passenger travel energy intensity



Source: IEA 2015

SEMED conclusions

- **Renewable energy:**
  - **Considerable progress has been made**
    - Institutional capacity and regulatory framework
  - **Future actions could include**:
    - Augmenting and strengthening existing policy portfolios
    - Ensuring consistency by removing fiscal support measures for fossil fuels
    - Continuing fostering competition
- **Energy efficiency:**
  - **Dedicated agencies needed to coordinate end-use data collection, set targets and monitor progress.**
  - **Specific improvements potential in transport and buildings, particularly for cooling and lighting**

ETC conclusions

- **Renewable energy:**
  - **Huge potential resources but need to:**
    - Remove subsidies for fossil fuels
    - Upgrade ageing transmission and distribution infrastructure
    - Develop national RE strategies with quantitative targets
    - Ensure grid and market access for RE generators and predictable remuneration
- **Energy efficiency:**
  - **Dedicated agencies needed to coordinate end-use data collection, set targets and monitor progress**
  - **Large potential in all sectors but particularly in district heating, industry, and buildings**

Background slides

EE in buildings

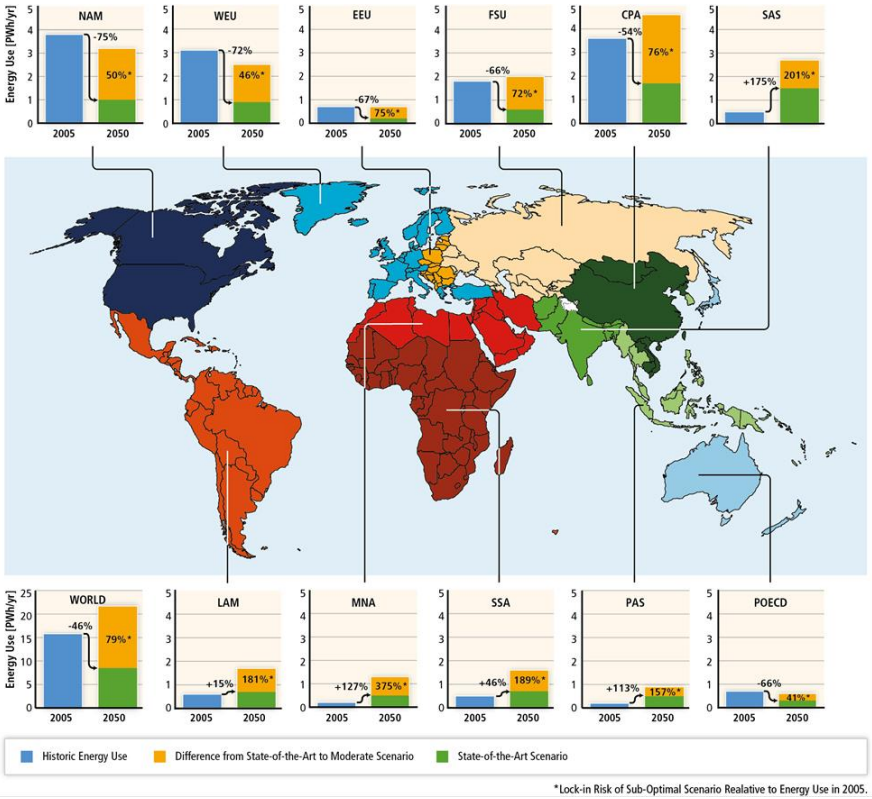
A multi-dimensional, holistic energy policy package is required

- Align **energy performance requirements** in different policy instruments
- Public and financial community **awareness**

Priorities:

- **District heating and cooling**
  - Modernise infrastructure and install meters
  - Ensure a predictable, attractive tariffs that allow for a recoup on investments
- Implement **construction standards**, **building codes**, **retrofits** and **building certification schemes** supported by resourced compliance systems

Potential to reduce final energy use for space heating & cooling through energy efficiency

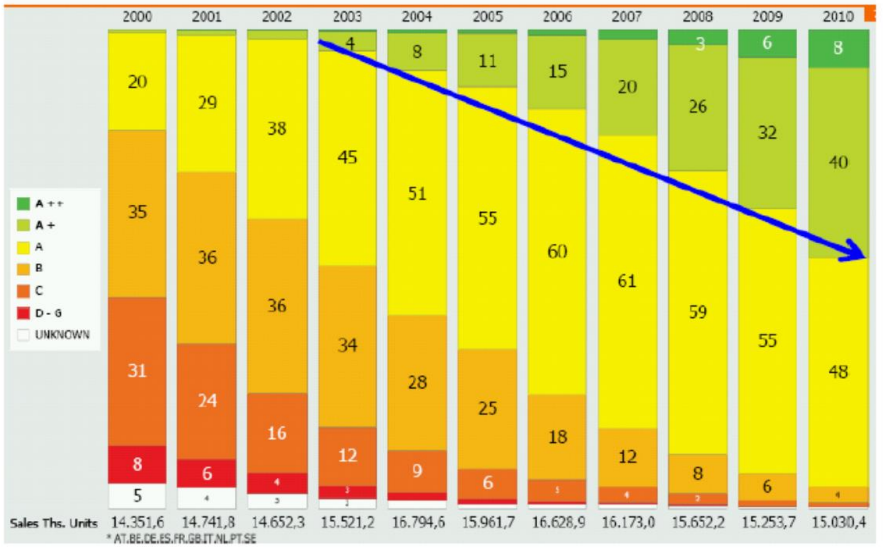


Source: IPCC 2014

EE in appliances and lighting

- **Regulatory policies** reduce electricity consumption of electrical equipment, compared to other policy measures
- **Early signalling** and **delivery** of a comprehensive policy plan drives markets further and faster than commercial development alone
- **Mandatory energy performance requirements** and **labels** are more effective when complemented with a **package of measures** that accelerate the **transformation** of the appliance market towards **high-efficiency products**

Efficient appliance market share in the EU



Source: www.come-on-labels.eu For selected number of European Union member countries

Priority: establish a **national appliance labelling system** supported by a **compliance system**