

# Energy Technology Perspectives 2016

## A Tale of Sustainable Cities

*Workshop on NEEDS AND OPPORTUNITIES FOR  
INTERNATIONAL COLLABORATION ON URBAN  
ENERGY SYSTEMS PLANNING -  
28-29 October 2014*

*Jean-François Gagne  
Energy Technology Policy Division Head  
International Energy Agency*

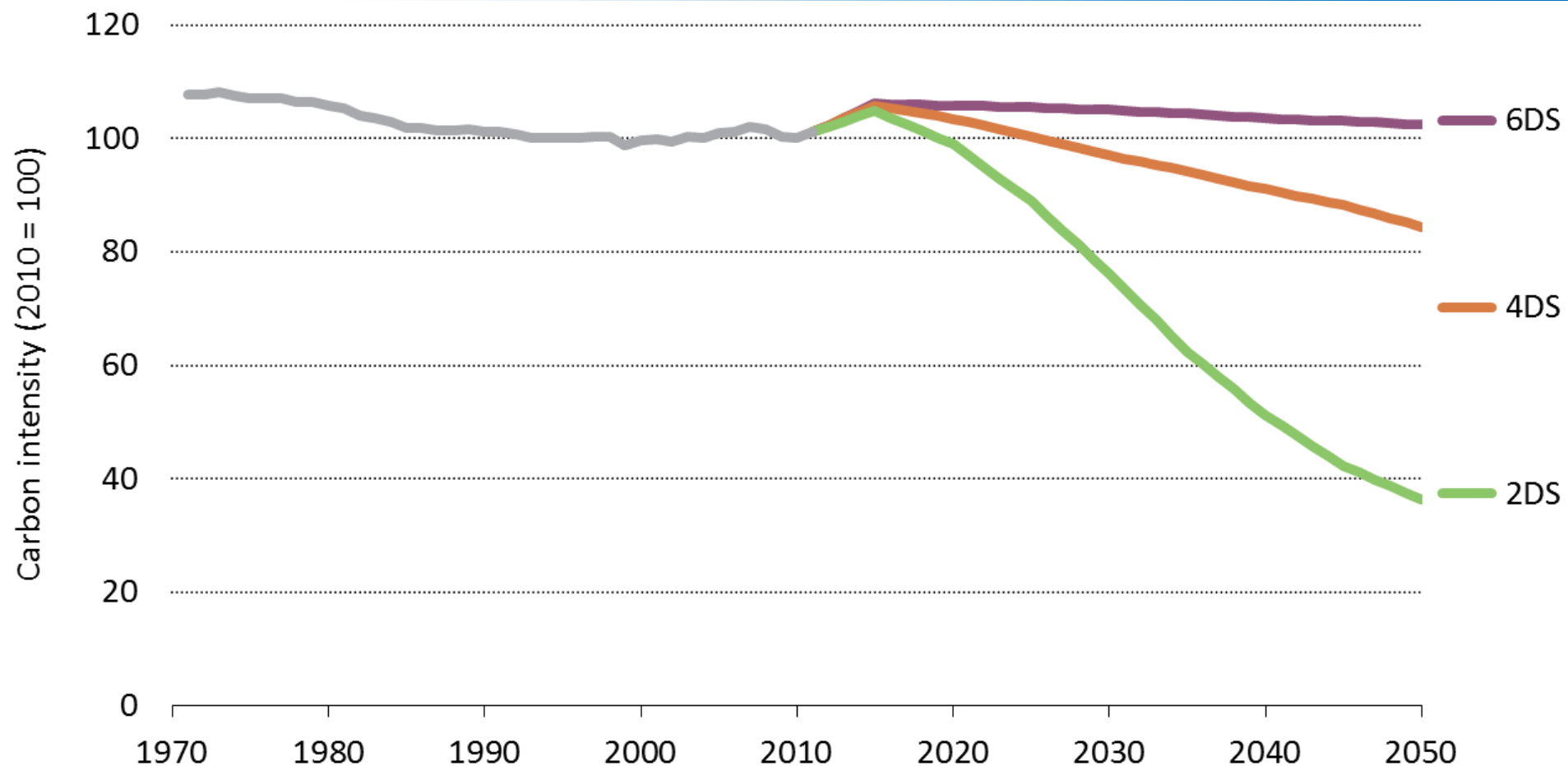
[www.iea.org](http://www.iea.org)

- Where do we need to go?
- Where are we today?
- How do we get there?



# The world faces a challenge

[www.iea.org](http://www.iea.org)

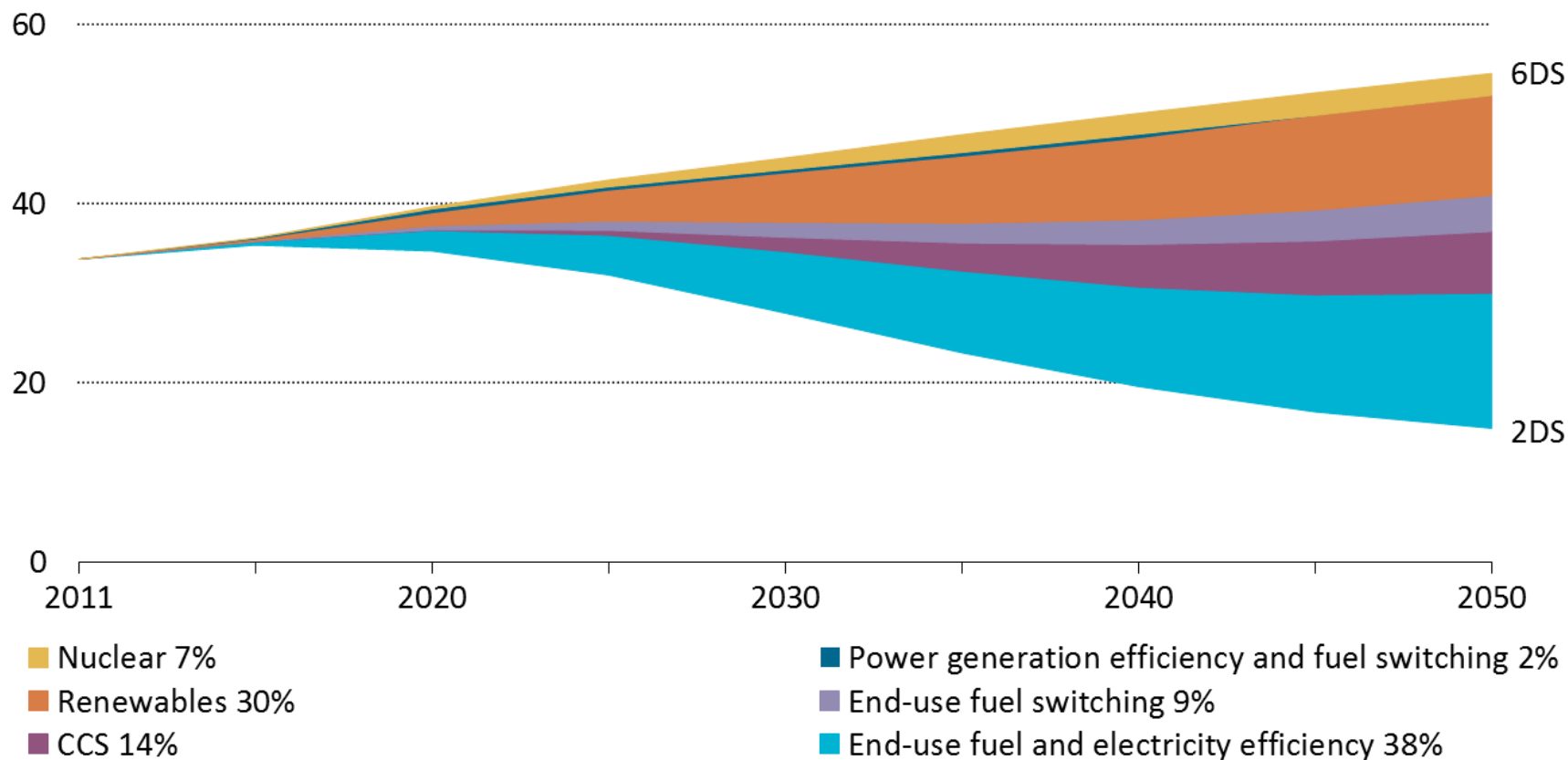


*Energy's carbon intensity is stuck AND we need to decouple economic growth from energy use*

ETP  
2014

# Energy Technology Perspectives

A transformation is needed...



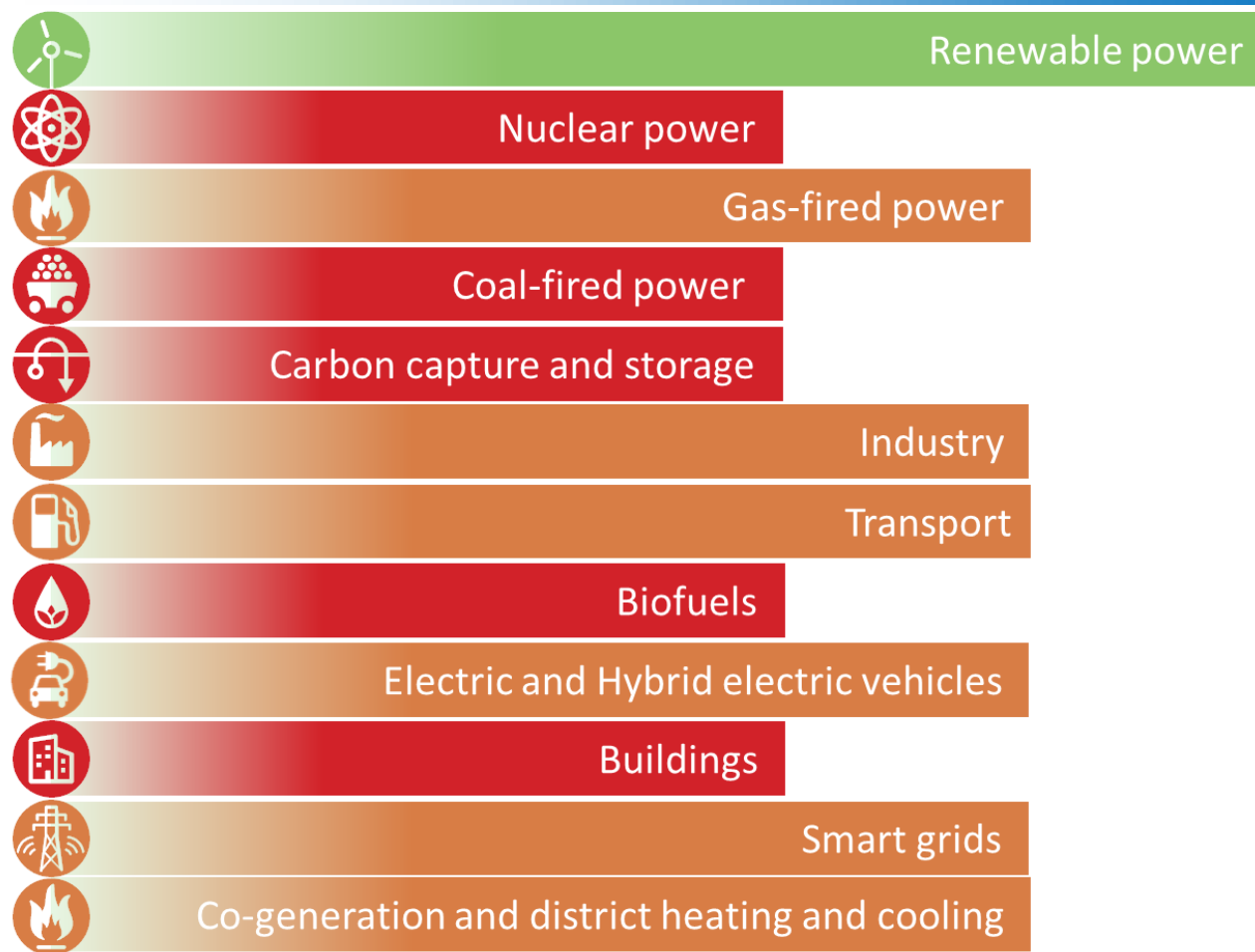
*...and we to have the tools to develop a strategy  
and be proactive.*

ETP  
2014



# Tracking Clean Energy Progress

We are not on track...



*...The political will to make meaningful progress at a global scale has yet to be demonstrated*

ETP  
2014

## ETP 2014

## ETP 2015

## ETP 2016

### Part 1. Setting the Scene

Global Outlook, Tracking Clean Energy Progress

### Part 2. Driving the Change (Thematic Focus) \*

The age of  
electrification

Energy Technology and  
Innovation impacts on  
Climate change mitigation

Urban Energy  
Systems

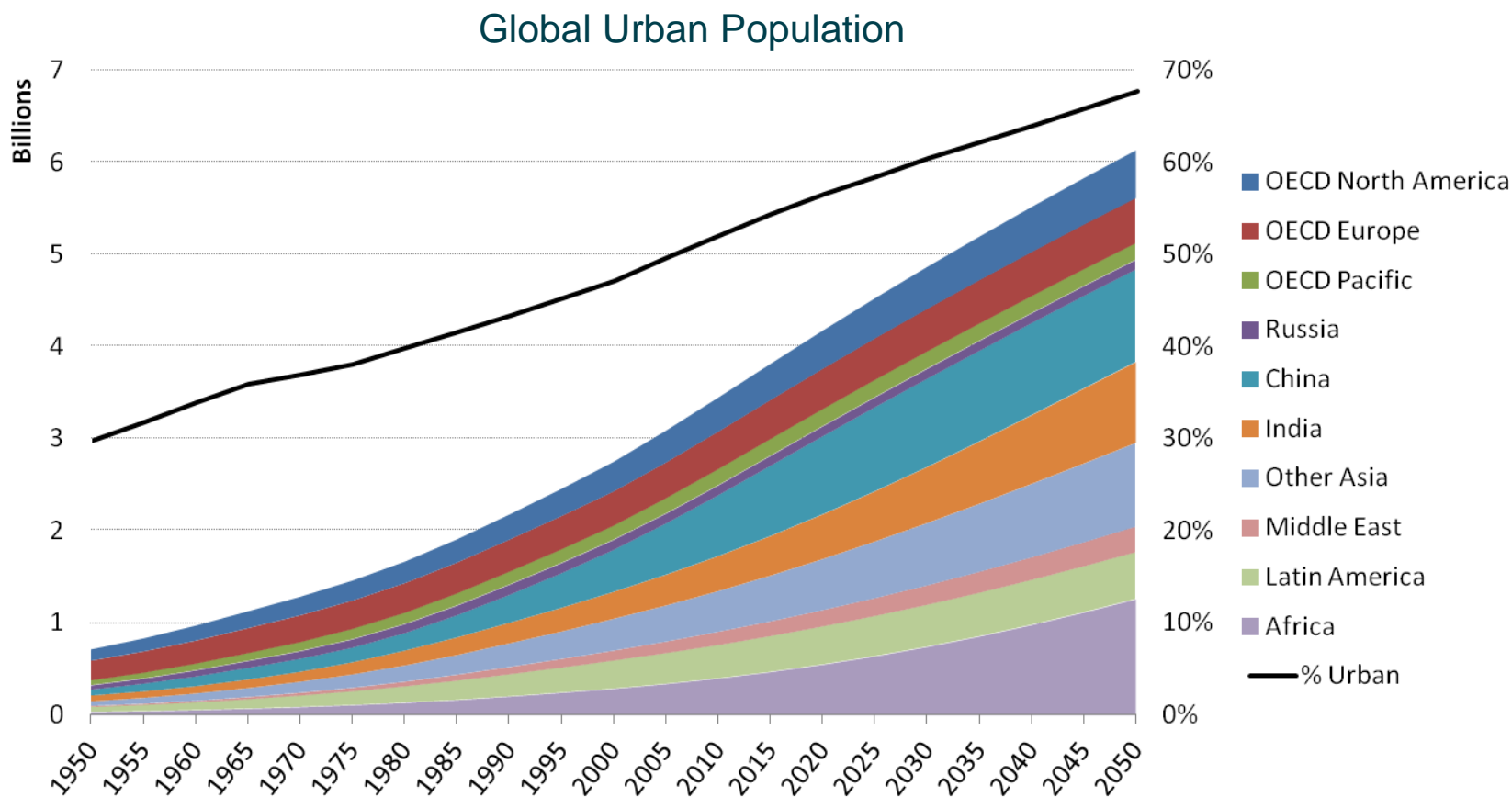
### Partner Country

India

China

Mexico

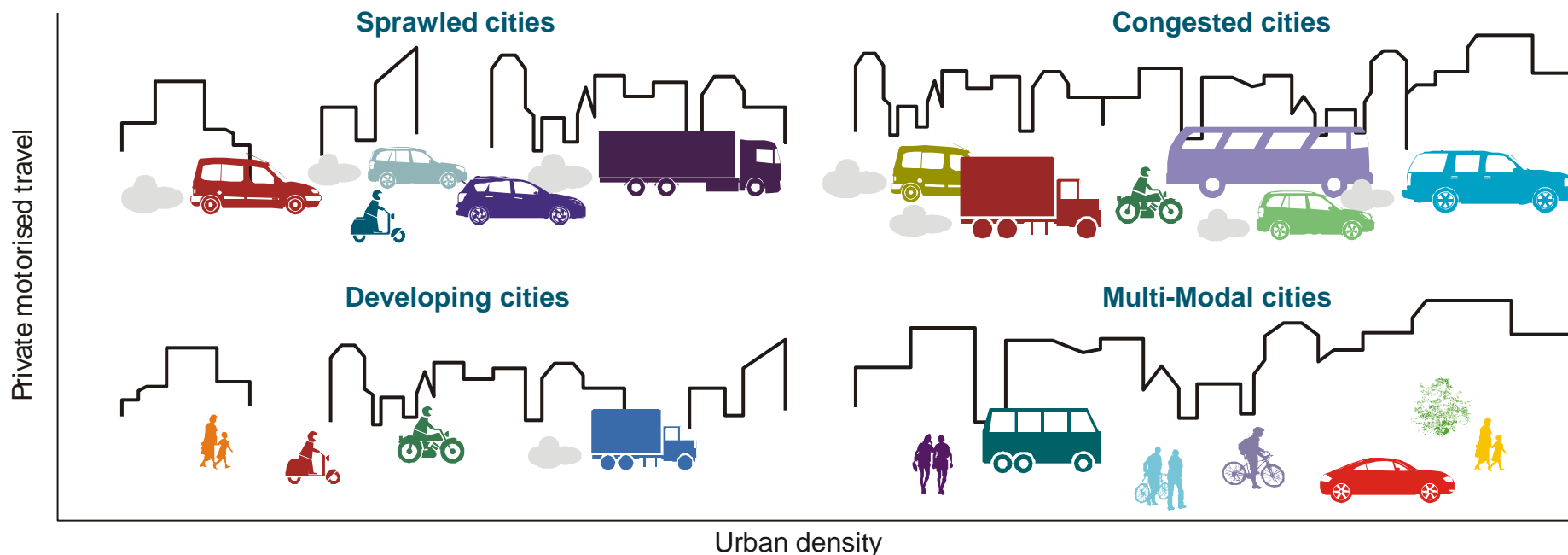
\* Each year included topics are: Low-carbon Generation, Fossil Fuels, Energy Demand, System Integration, and Policy and Finance



Source: UN DESA, 2012

*Global urban populations are growing rapidly,  
and with them demand for energy in cities*

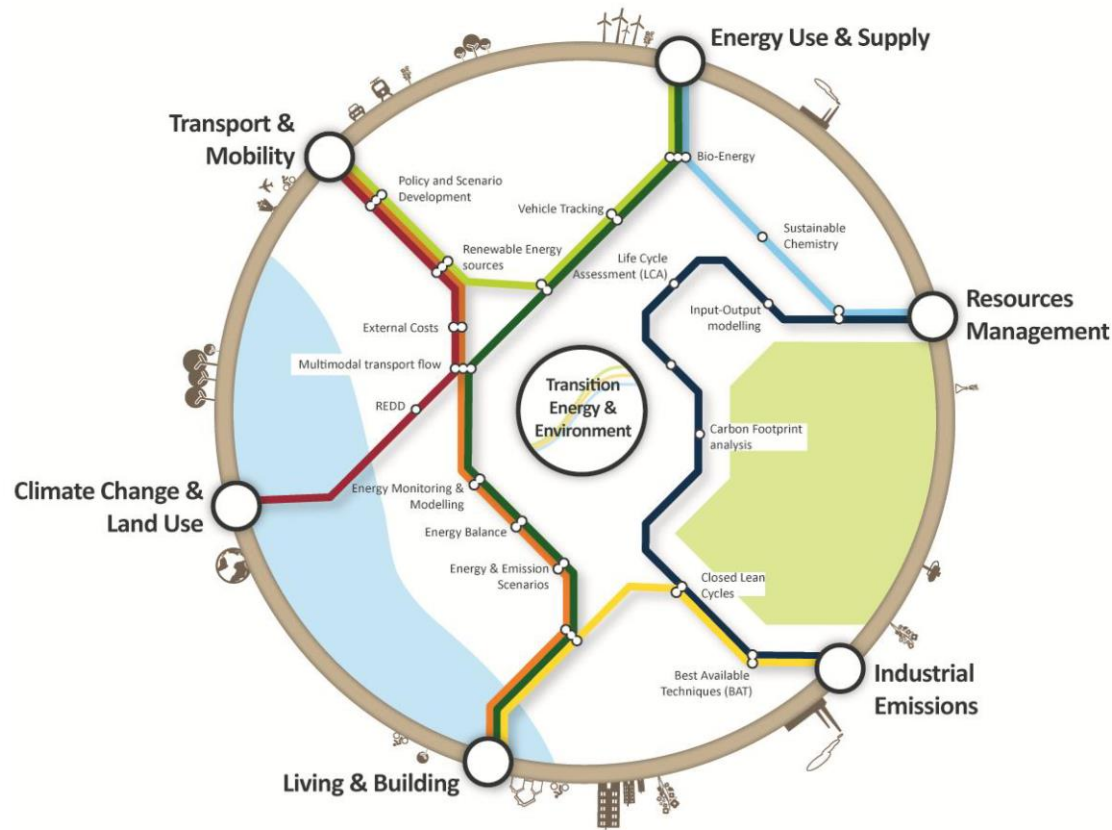
# What will future cities look like?



*No two cities are the same, yet there are common denominators that can be used to characterise them*

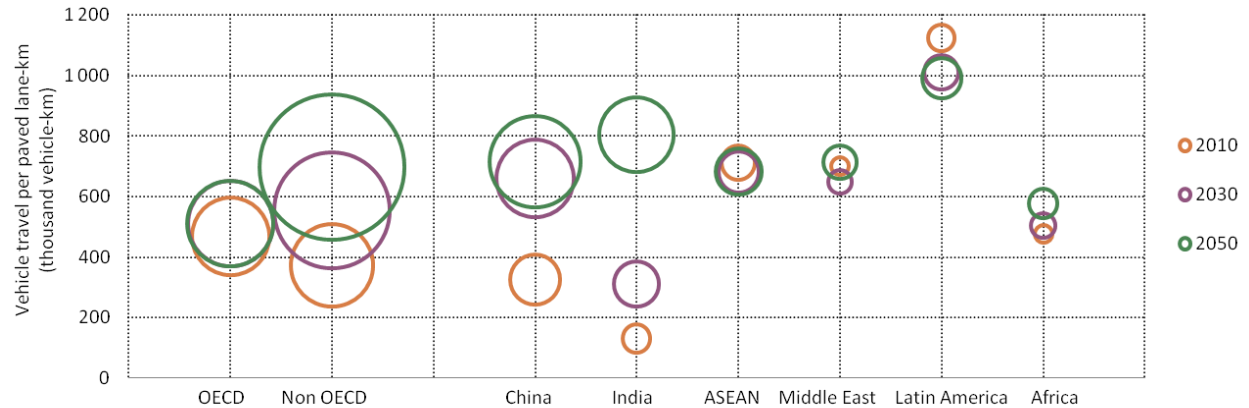


# Building Sustainable Urban Energy Systems

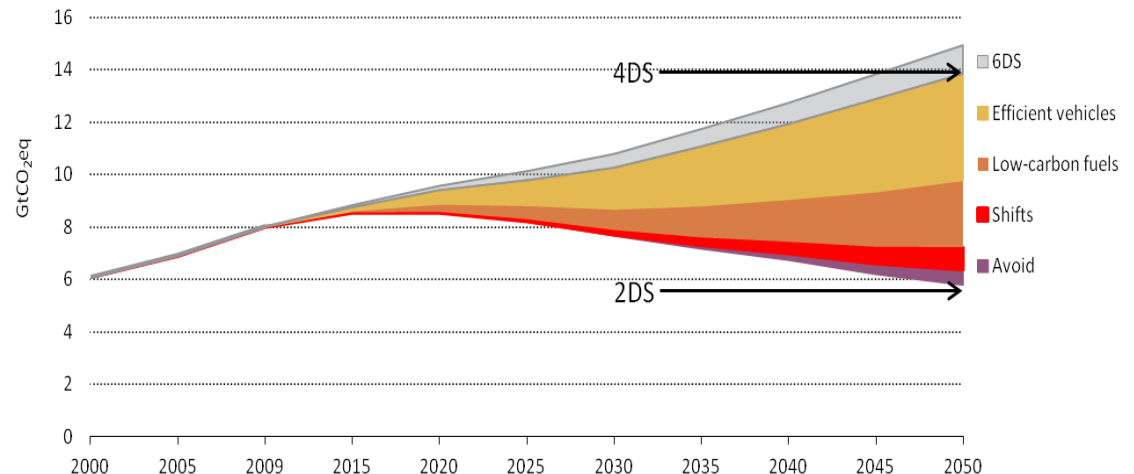


*Global and municipal challenges and opportunities are similar in nature*

## ■ Roadway Occupancy

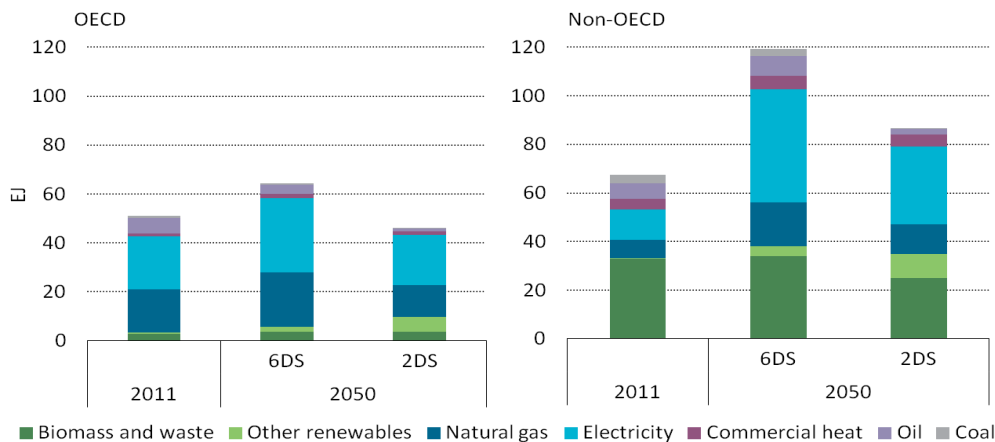


## ■ Transportation Energy

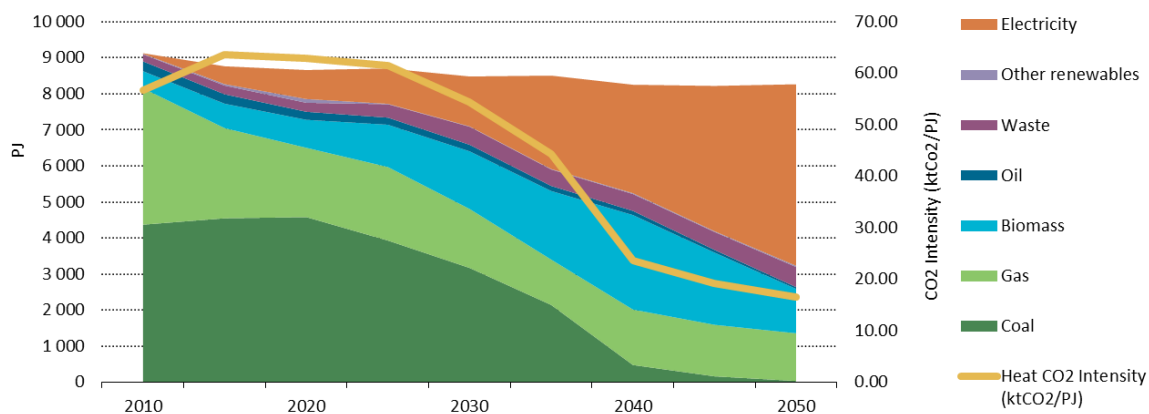


# Linking Local and National Policy Objectives

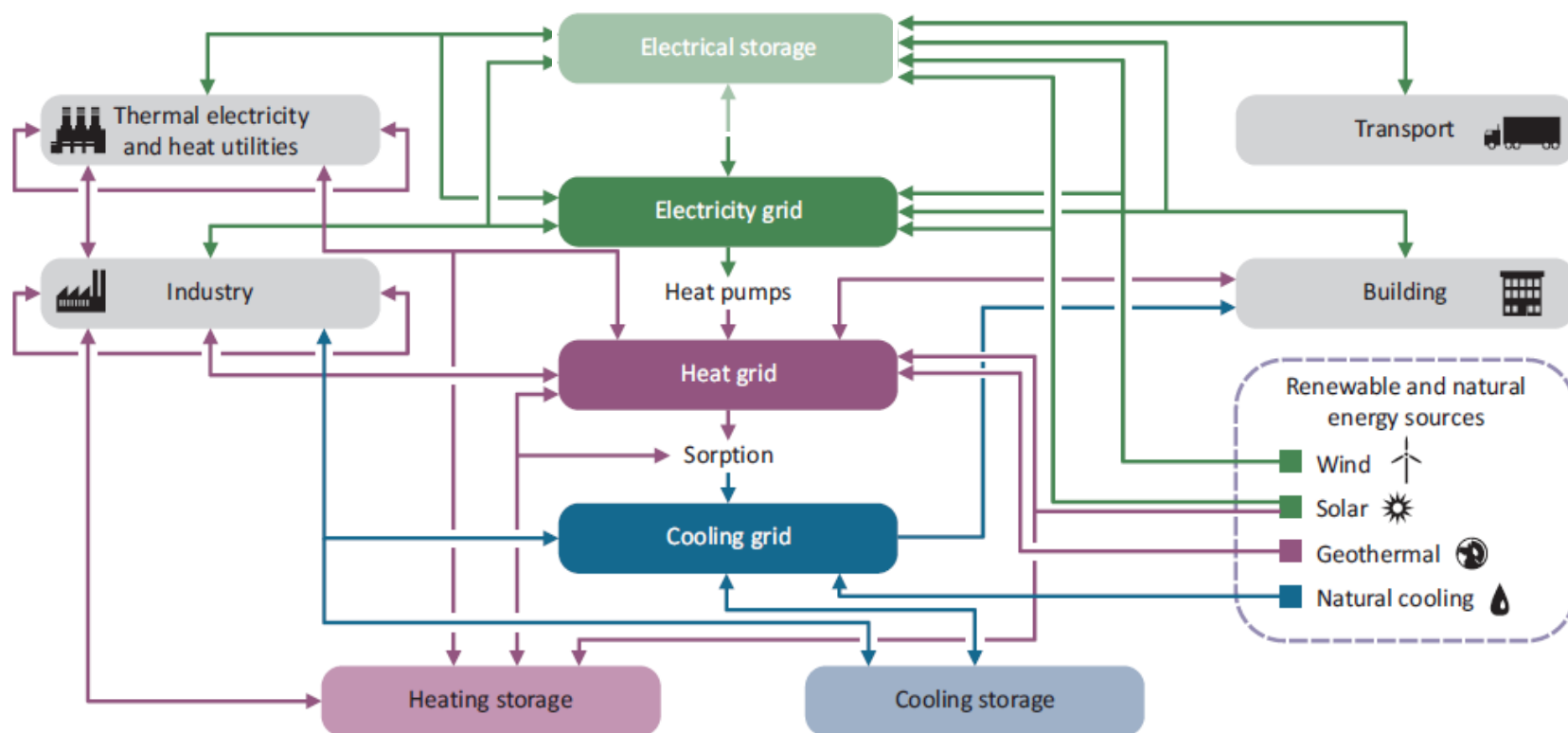
## ■ Heat demand

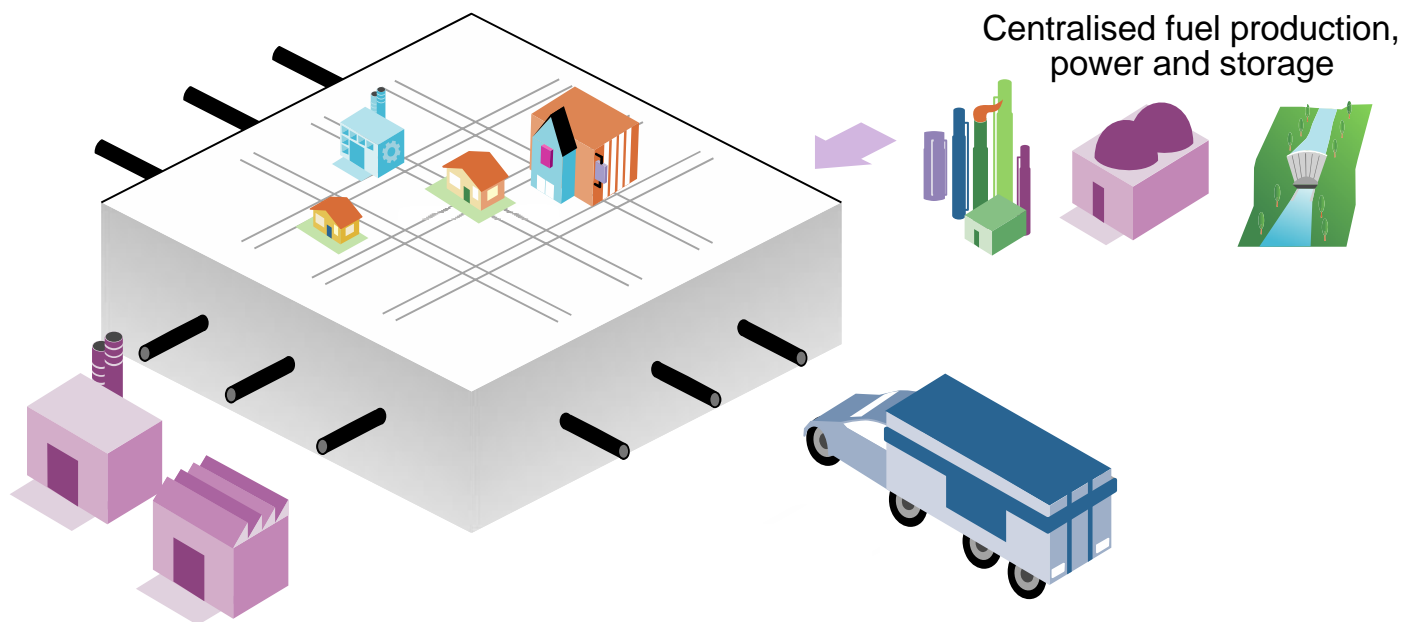


## ■ Energy mix



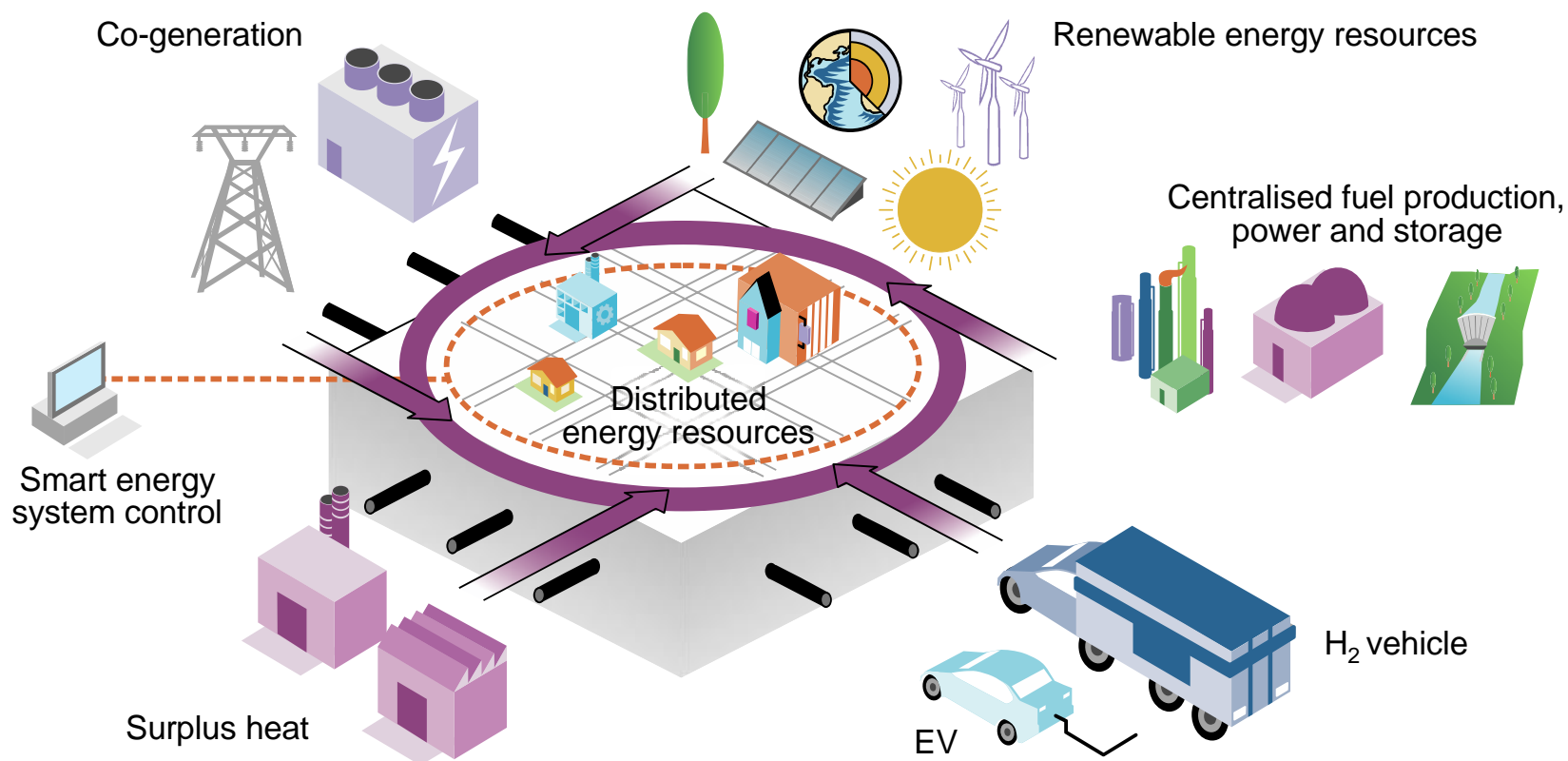
*Linking heat and electricity systems: Co-generation and DHC solutions for a clean energy future. IEA, 2014.*





*Today's energy system paradigm is based on a unidirectional energy delivery philosophy*





*A sustainable electricity system is a smarter, multidirectional and integrated energy system that requires long-term planning for services delivery*

- How important are cities' energy decisions and goals in achieving national policy objectives
  - What could be the added value of a new analytical framework for modelling urban energy systems
- What are concrete venues for better alignment of national and local policy-making
  - Role of sustainable urban transport
  - Links between built environment and energy use
  - Local networks impacts on national grids
- Can local efforts be supported by national measures
  - Identify means to support local programs and attract investments and financing

# Explore the data behind ETP



[www.iea.org/etp](http://www.iea.org/etp)



# IEA Technology Roadmaps

Mapping where we need to go [www.iea.org](http://www.iea.org)

2009



2010



2011



2012



2013



2014



2015

- Hydrogen
- Smart Grids

Low-Carbon Technology Roadmaps

- **Goal to achieve**
- **Milestones to be met**
- **Gaps to be filled**
- **Actions to overcome gaps and barriers**
- **What and when things need to be achieved**





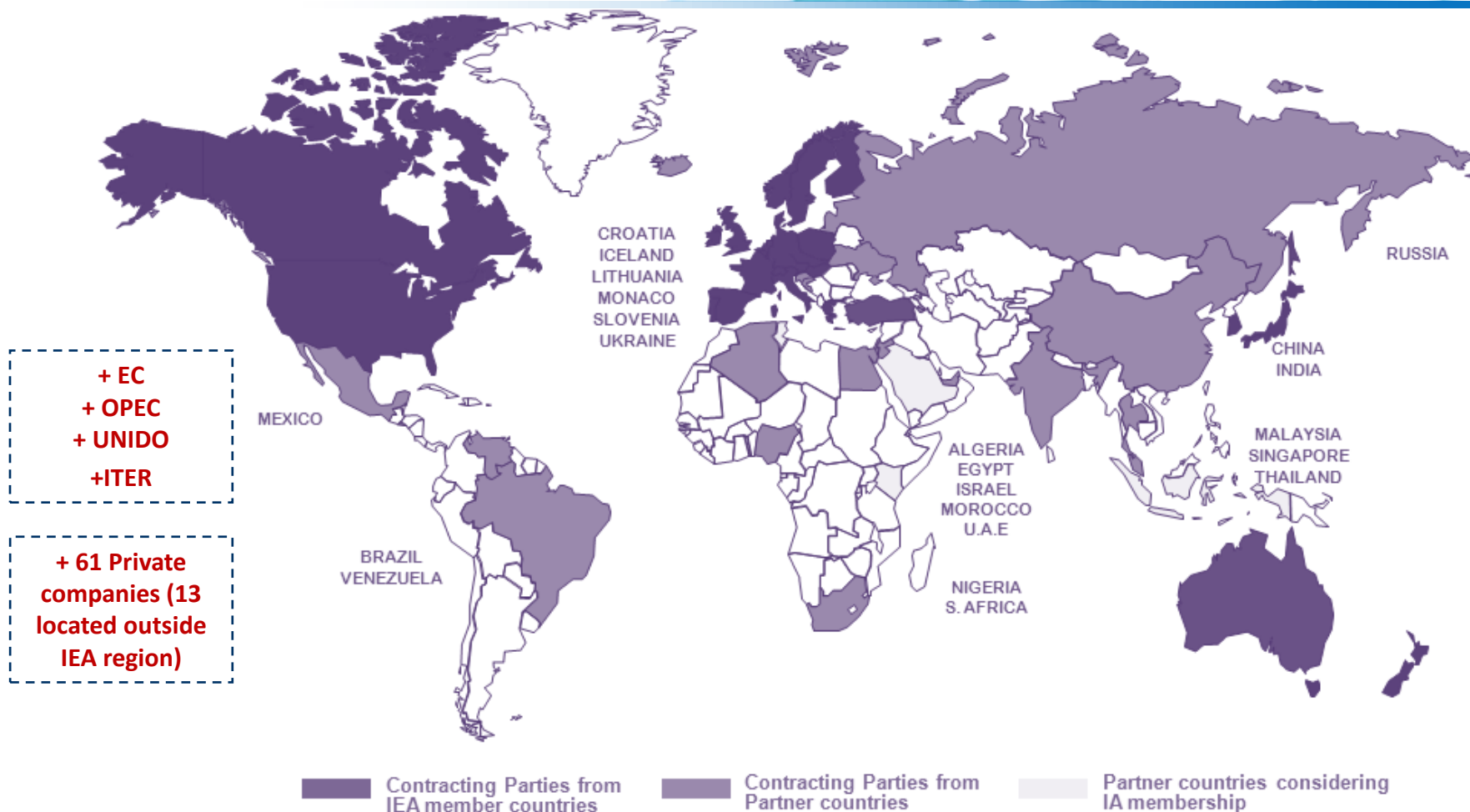
# Future work: 2015 Smart grids roadmap

- **Primary goal: Present international consensus for SG technologies on:**
  - Technology and policy milestones and actions
  - Market and regulatory/legal needs, policy design
- **Concentrate all IEA/Technology Network work on SG/DSI**
  - ISGAN collaboration
  - Expert workshops, steering group
    - First workshop planned end of 2014
- **State-of-the-art data and analysis to evaluate potential/costs of DSI including power-to-heat/power-to-fuels**
  - Comparison with other system integration options



Low-Carbon Technology Roadmaps

# IEA Implementing Agreements (IAs)



**More than 6,000 scientists and experts**  
**Representing 500 government agencies, research organisations,**  
**universities, energy companies, industries, businesses, and consultants**  
**Over 1,400 projects completed to date**

## OBJECTIVES OF ETP 2016

- Answer the most critical questions related to different sectors or aspects of urban energy systems, e.g., buildings, transportation, distributed energy system integration, etc.;
- Inform better decision-making of policy-makers;
- Identify specific areas for future work in collaboration with partners.

