

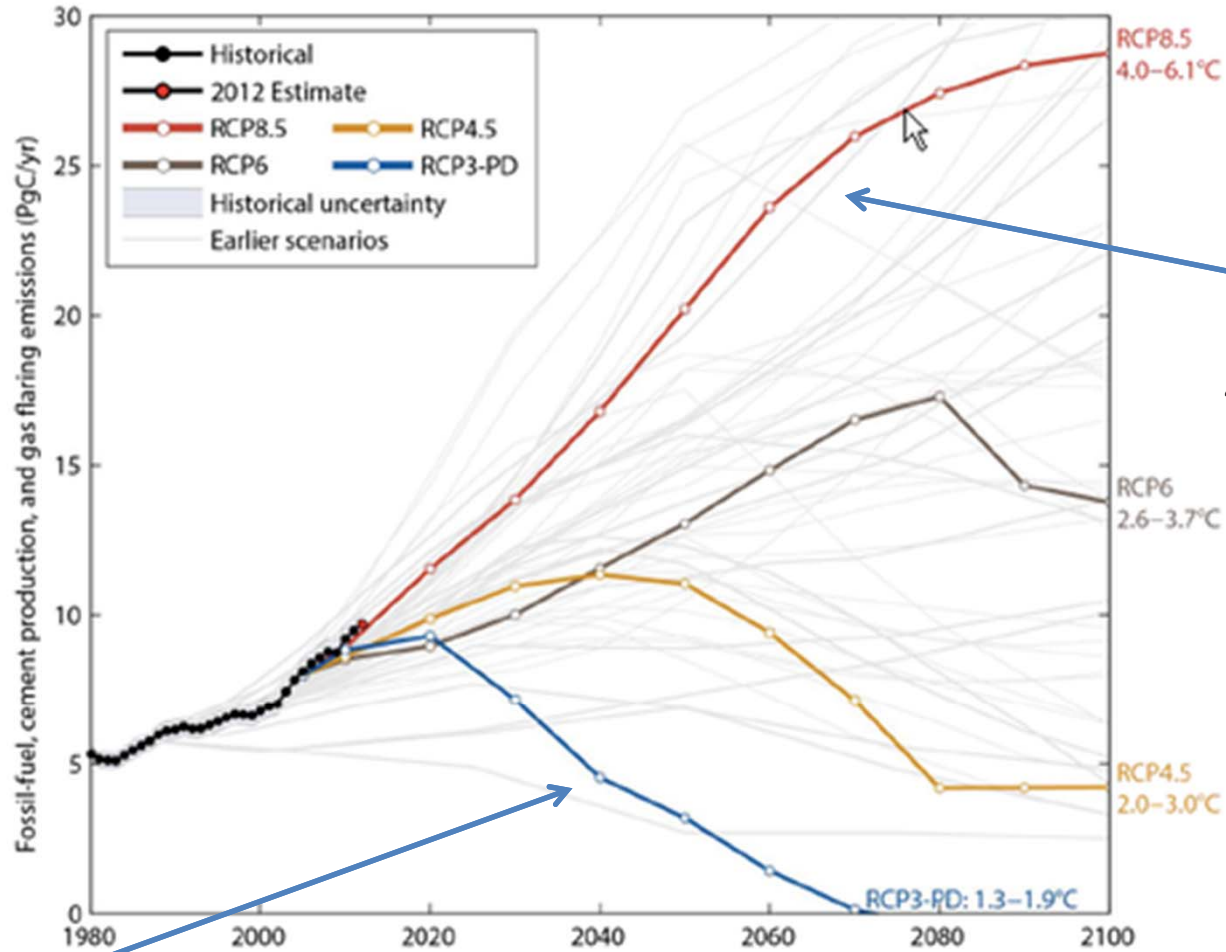
DEEP DECARBONIZATION

Prof. Jeffrey Sachs

ASIAN DEVELOPMENT BANK

AUGUST 4, 2015

Emissions are heading to a 4.0-6.1°C “likely” increase in temperature
Large and sustained mitigation is required to keep below 2°C



BAU:
4-6 degree C

Linear interpolation is used between individual datapoints

2-degree C

Source: [Peters et al. 2012a](#); [Global Carbon Project 2012](#);

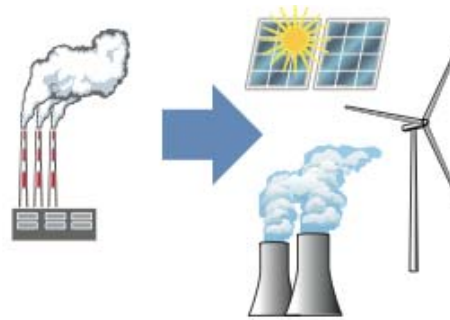
Main Decarbonization Strategies

Strategy

Energy Efficiency



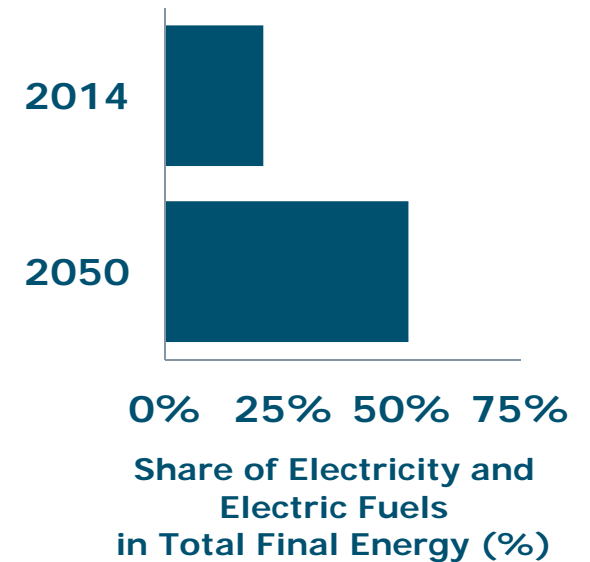
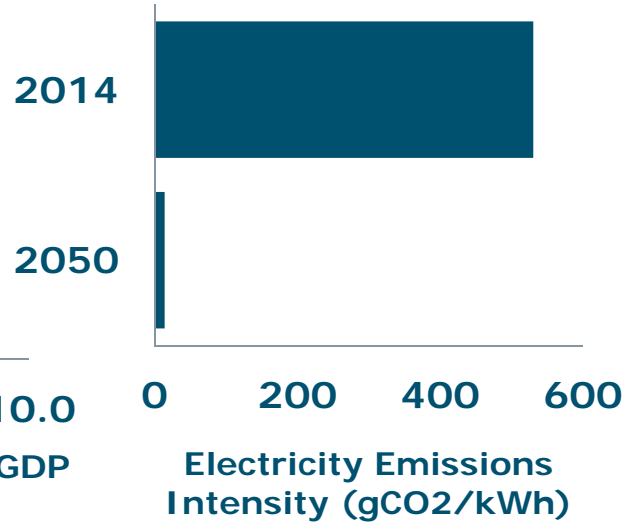
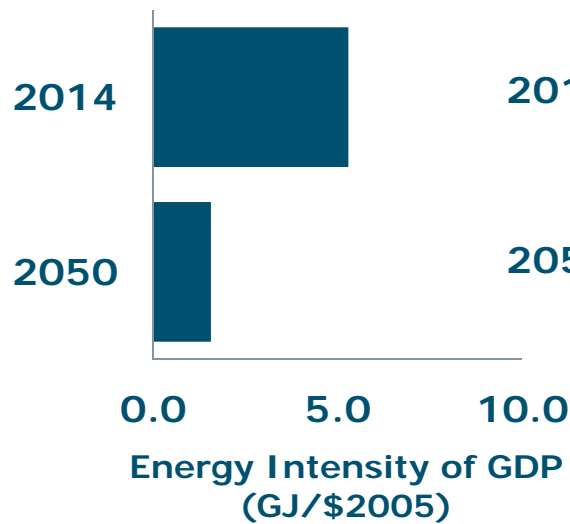
Decarbonization of Electricity



End Use Fuel Switching to Electric Sources



Key Metric of Transformation



pathways to
deep decarbonization

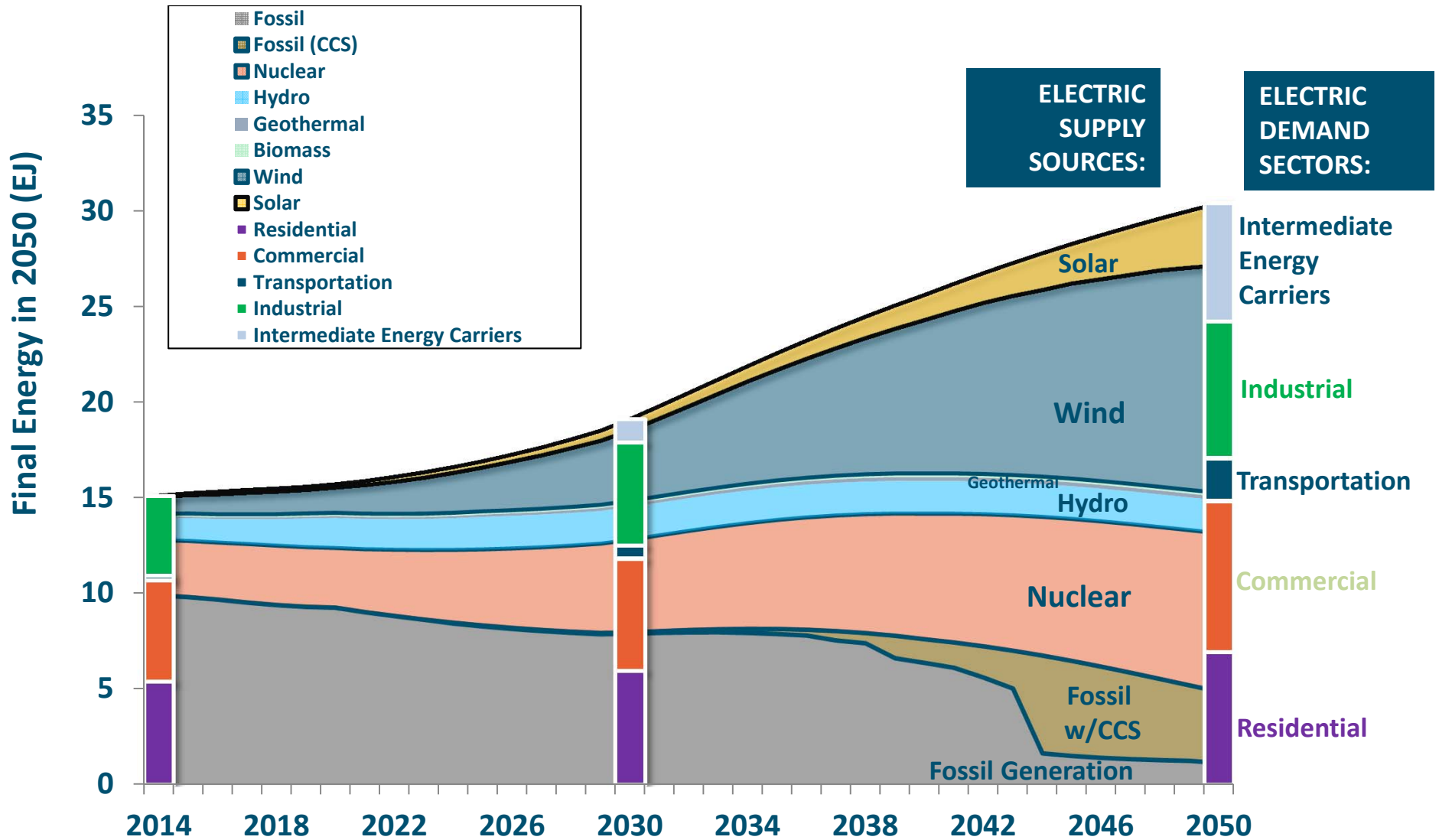
interim 2014 report

**THE DEEP
DECARBONIZATION
PATHWAYS
PROJECT**

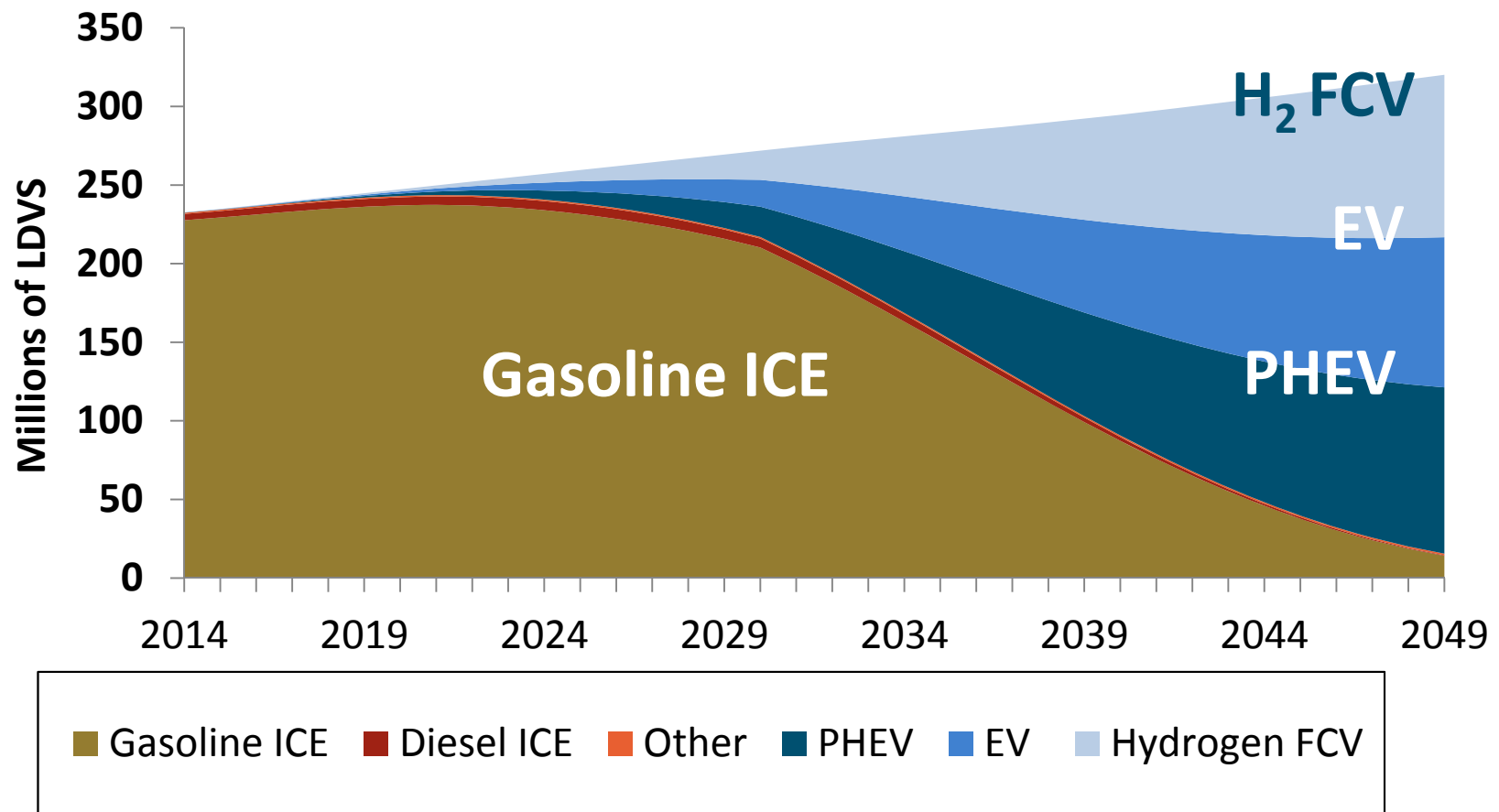
IDDRI
Institut de Développement
Durable et de Relations
Internationales



Electricity Supply: By Fuel Type and Demand Sector

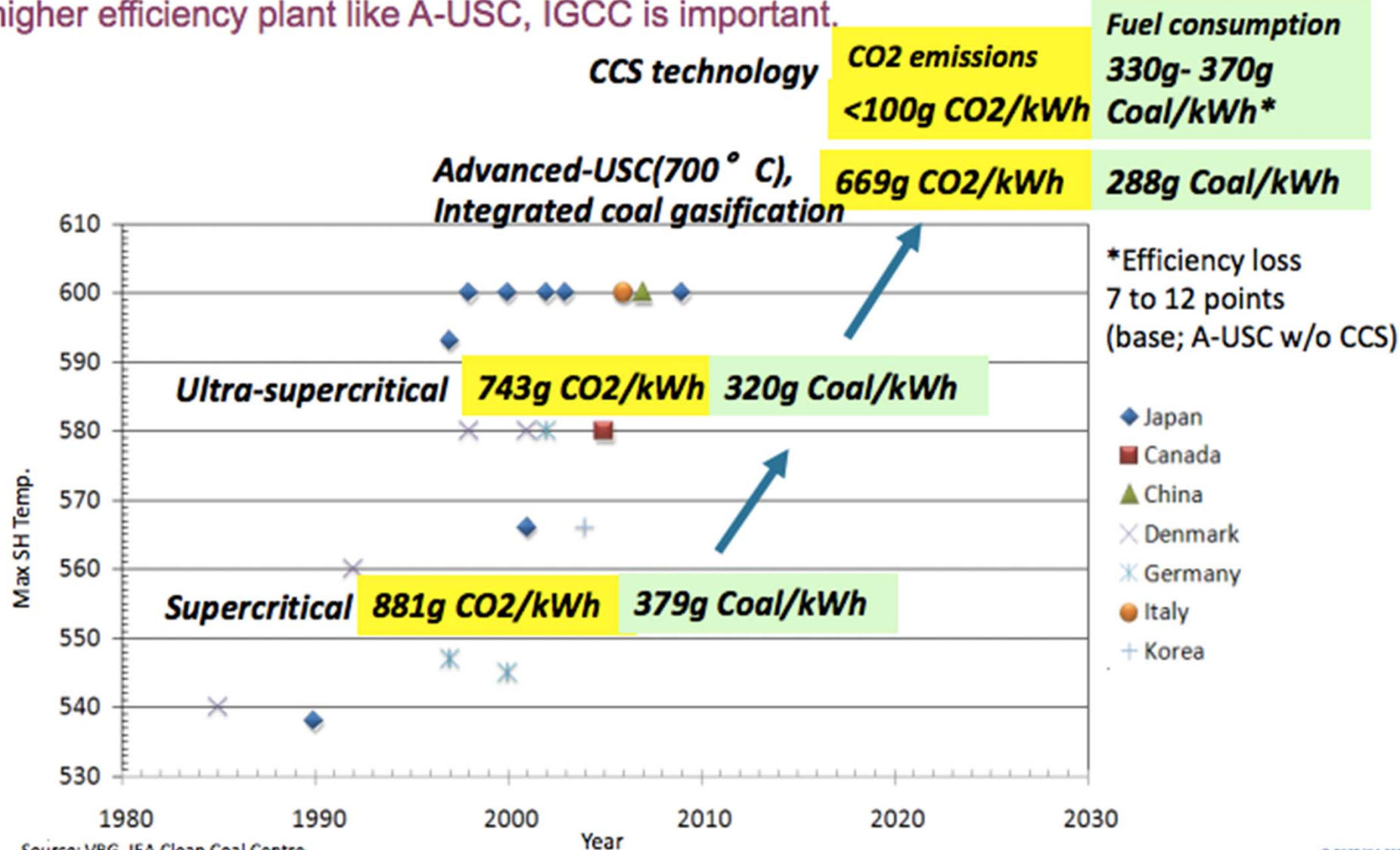


Transportation Sector: Annual Light-Duty Vehicle Stock



Coal-fired plant status: past and future

USC plants have been operated in Europe and Japan. Recently, most advanced plants in China have reached the same steam condition. Further R&D effort to commercialize higher efficiency plant like A-USC, IGCC is important.



THE NEED FOR NEW LOW-CARBON TECHNOLOGIES

- CARBON CAPTURE AND SEQUESTRATION
- STORAGE OF RENEWABLE ENERGY
- ZERO-EMISSION VEHICLES
- FOURTH-GENERATION NUCLEAR ENERGY
- SMART GRIDS BASED ON HIGH RENEWABLES
- ADVANCED BIOFUELS AND SYNTHETIC FUELS
- ADVANCES IN SOLAR PV

THESE ARE PART OF A BROADER SET OF NEEDED SUSTAINABLE TECHNOLOGIES, INCLUDING SUSTAINABLE AGRICULTURE AND URBAN DESIGN

LOW-CARBON ADVANCES CAN BE “DIRECTED” AS WITH OTHER MODERN BREAKTHROUGHS:

RADAR

CRYPTOGRAPHY

MANHATTAN PROJECT

COMPUTING

SEMICONDUCTORS (Intl Tech Roadmap for Semiconductors)

MOON MISSION

INTERNET

HUMAN GENOME PROJECT

PPPS FOR MEDICINES, VACCINES, AND DIAGNOSTICS

(GATES)

HIGGS BOSON (CERN)

PILLARS OF A GLOBAL AGREEMENT AT COP21

AGREEMENT BASED ON 2-DEGREE C UPPER LIMIT (CORE)

GLOBAL CARBON BUDGET FOR 2-D C (ANNEX)

MODEST AND LEGALLY BINDING INDCs TO 2030
(CORE/ANNEX)

BOLD ASPIRATIONAL DDPS TO 2050 BY 2017
(CORE/ANNEX)

PPPS FOR LOW-CARBON TECHNOLOGIES (CORE/ANNEX)

CLIMATE FINANCING (MITIGATION, ADAPTATION, LOSS
AND DAMAGE) FOR LOW-INCOME COUNTRIES

PATH TO AN EFFECTIVE AGREEMENT AT COP21:

CHINA AND US CONCUR ON SIX KEY PILLARS

CHINA, US, AND EU FORM CORE GROUP

CANADA, AUSTRALIA, AND GCC JOIN CORE GROUP

CORE GROUP PLEDGES TECHNOLOGY PACKAGE

PRIVATE SECTOR LEADERS JOIN TECHNOLOGY PLEDGE

C40 CITIES JOIN CORE GROUP

ARCTIC COUNTRIES AGREE ON A MORATORIUM OF

ARCTIC EXPLORATION

WORLD AGREES ON DEEP-SEA MORATORIUM

RAINFOREST COUNTRIES PLEDGE END TO DEFORESTATION

FORMULA AGREED FOR FUNDING GREEN CLIMATE FUND