The Role of CCS in the Middle East

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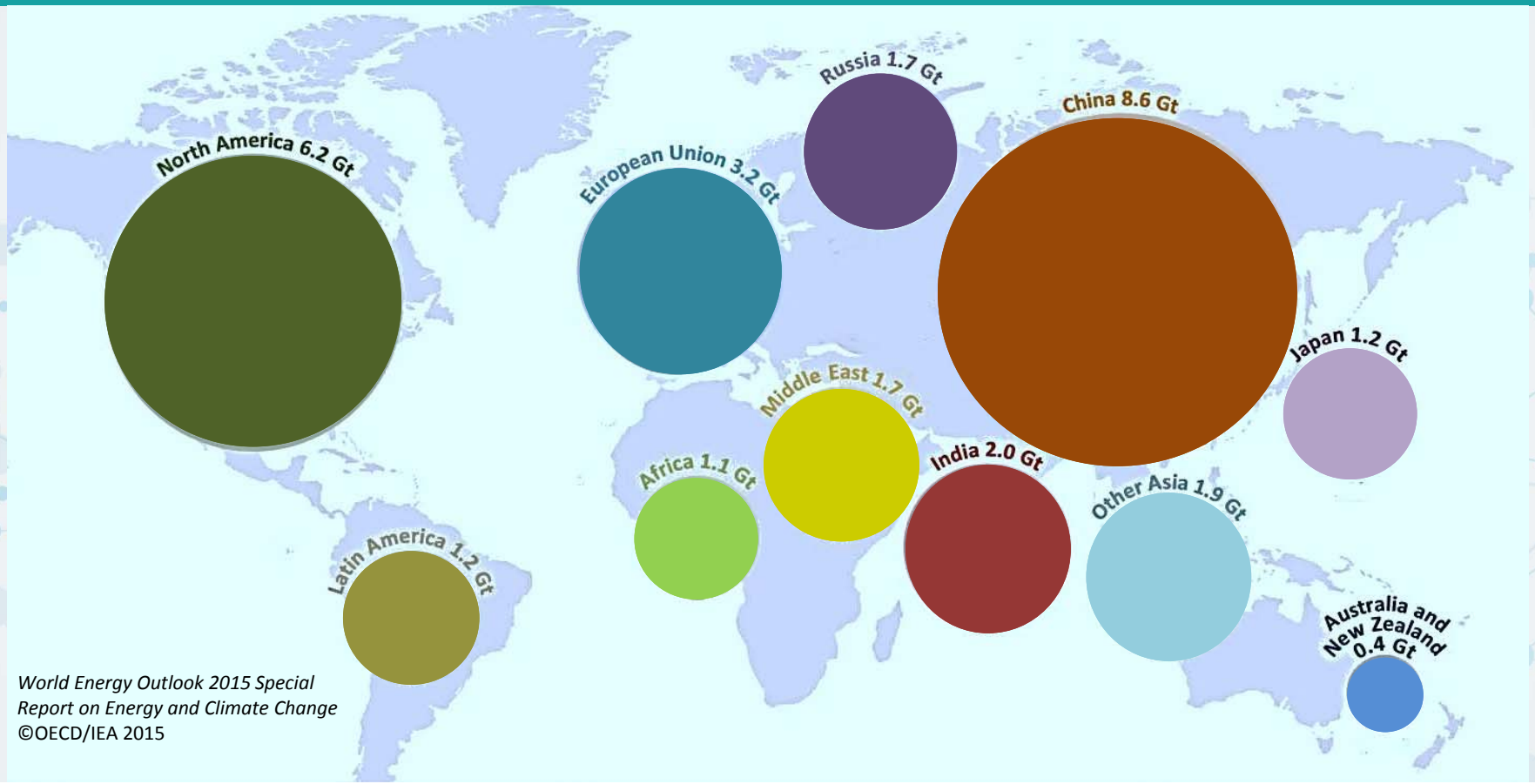
Outline

- Introduction
  - Overview of the Middle East
- Highlights of CCS Efforts in Middle East
  - Large scale CCS and EOR projects
  - Pioneering R&D activities
  - Building intellectual capacity
- Conclusion

Introduction

- Bahrain
- Iran
- Iraq
- Jordan
- Kuwait
- Lebanon
- Oman
- Qatar
- Saudi Arabia
- Syria
- UAE
- Yemen

Energy-related CO2 emissions, 2014



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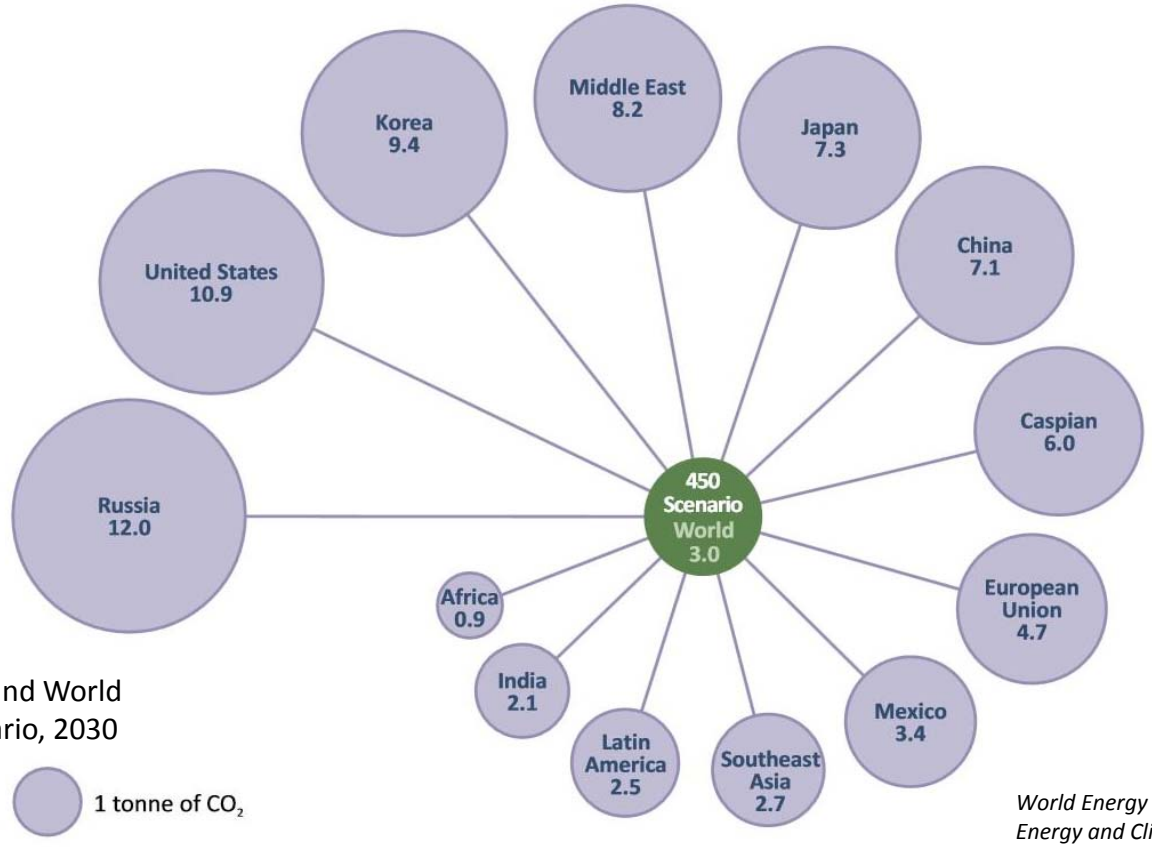
Energy-related CO2 emissions per capita



Regional INDC Scenario and World Average in the 450 Scenario, 2030

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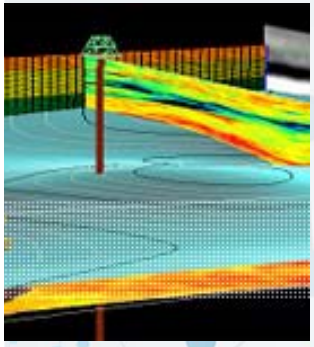
CCS Efforts in the Middle East



Large scale CCS and EOR projects

Uthmaniyah (Saudi Arabia)

أرامكو السعودية
saudi aramco

Emirates Steel CCUS Project (UAE)

ادنوك
ADNOC
Masdar

Jubail CO2 Plant (Saudi Arabia)

سابك
sabic

QAFAC CO2 Recovery Plant (Qatar)

قافاك
QAFAC
شركة قطر للإضافات البترولية المحدودة
Qatar Fuel Additives Company Limited

Uthmaniyah (Saudi Arabia)

- By Saudi Aramco
- Integrated CO2 capture, transport and storage through EOR
- CO2 capture and storage capacity of 800,000 tons annually

Emirates Steel CCS Project (UAE) *in progress*

- Joint venture between Adnoc and Masdar
- World's first iron and steel project to apply CCS at large scale
- CO2 capture capacity will be 800,000 tons annually for enhanced oil recovery

Jubail CO_2 Plant (Saudi Arabia) *in progress*

- Led by Saudi Basic Industries Corporation (SABIC)
- CO_2 to be used in the production of methanol and urea
- Estimated 500,000 tons of CO_2 emissions will be saved each year

QAFAC CO2 Recovery Plant (Qatar)

- Led by Qatar Fuel Additives Company (QAFAC)
- CO2 is captured from combustion exhaust gas emitted in the methanol production process and used as feedstock to boost methanol production
- Recovery plant of around 500 tons per day of CO2

Saudi R&D activities

KAPSARC

- Provides advice and assists in planning for CO2 capture and reuse
- “CCS Implementation Strategies for the Kingdom of Saudi Arabia” inaugural project

KACST/KFUPM Technology Innovation Center

- The mission of the KACST/KFUPM Technology Innovation Center for CCS is to develop, transfer, enhance and apply the technologies of carbon capture and sequestration to the nation

KACST-TIC in Carbon Capture and Sequestration
مركز الابتكار التقني لاحتجاز وتخزين الكربون

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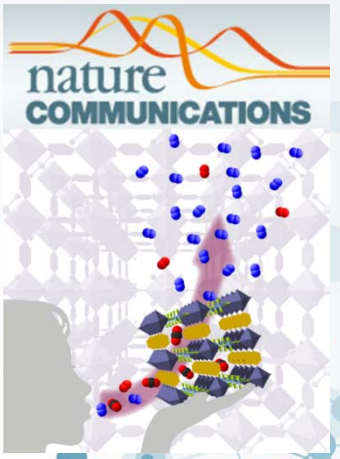
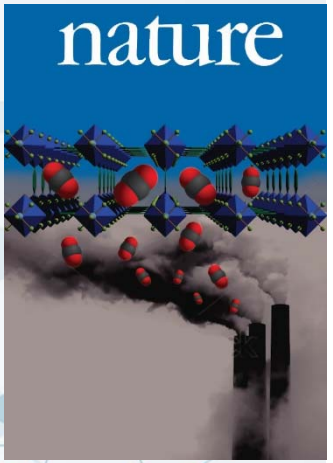
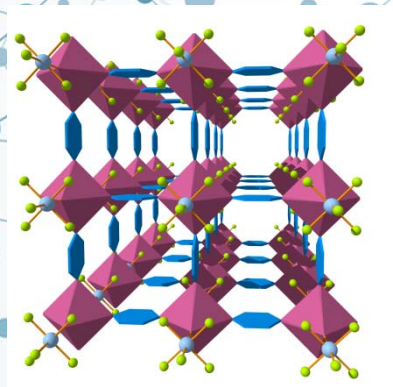
KAUST Advanced Membranes & Porous Materials Research Center







SIFSIX-3-Cu
Best material to date
for CO_2 removal in confined space
Nature Communications, 2014

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KAUST Catalysis Research Center

Building intellectual capacity

Petroleum Institute

المعهد البترولي
THE PETROLEUM INSTITUTE
University & Research Center جامعة ومركز أبحاث

King Abdullah University of Science and Technology (KAUST)

جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

Upstream Petroleum Engineering
Research Center

Collaboration for Success






Thank You

Resources

1. Global CCS Institute, *The Global Status of CCS: 2014*
2. International Energy Agency, www.iea.org
3. World Energy Outlook 2015 Special Report on Energy and Climate Change, IEA