International Energy Agency
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Water and Energy Nexus

Round Table on the Water – Energy – Food Nexus

September 25, 2014

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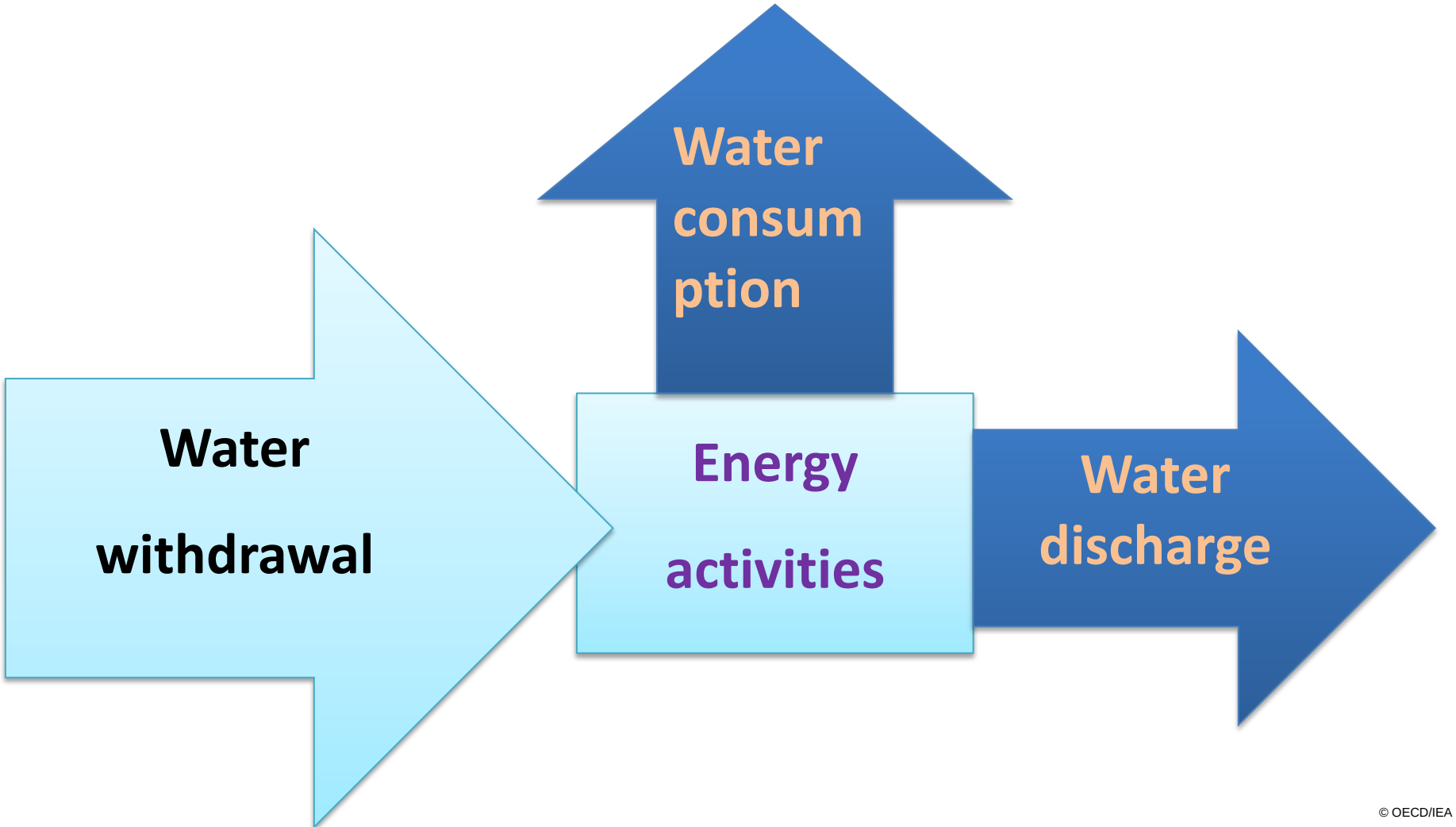
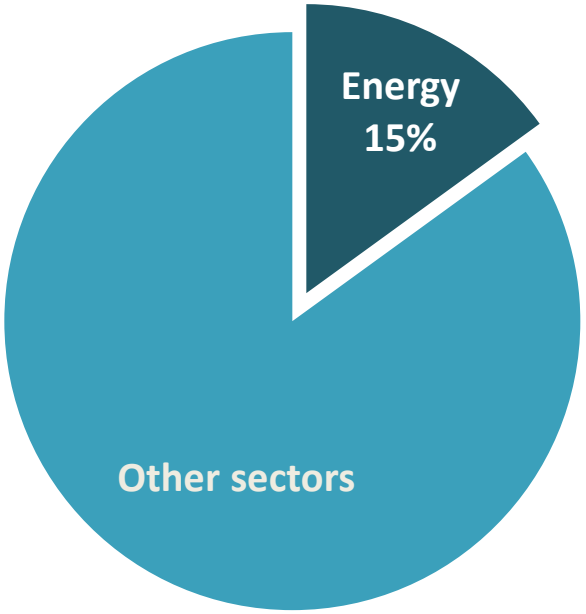
Definitions

Water for energy

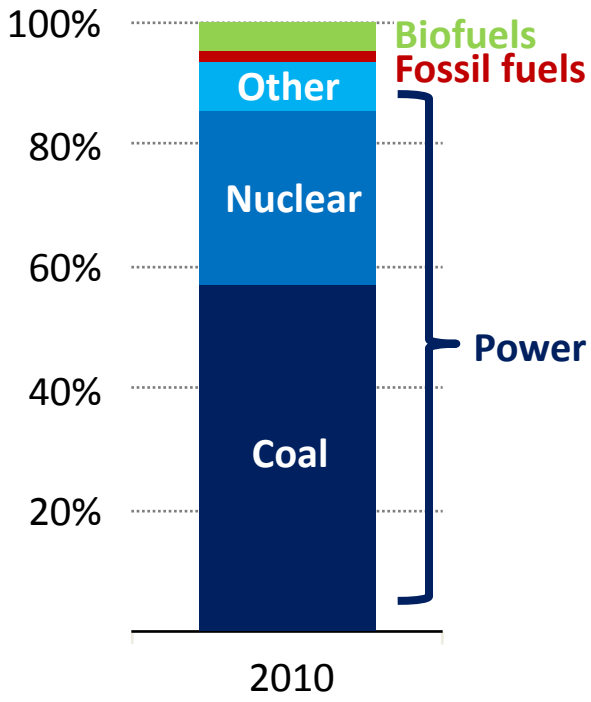


Water withdrawal for energy, 2010

Global water withdrawal



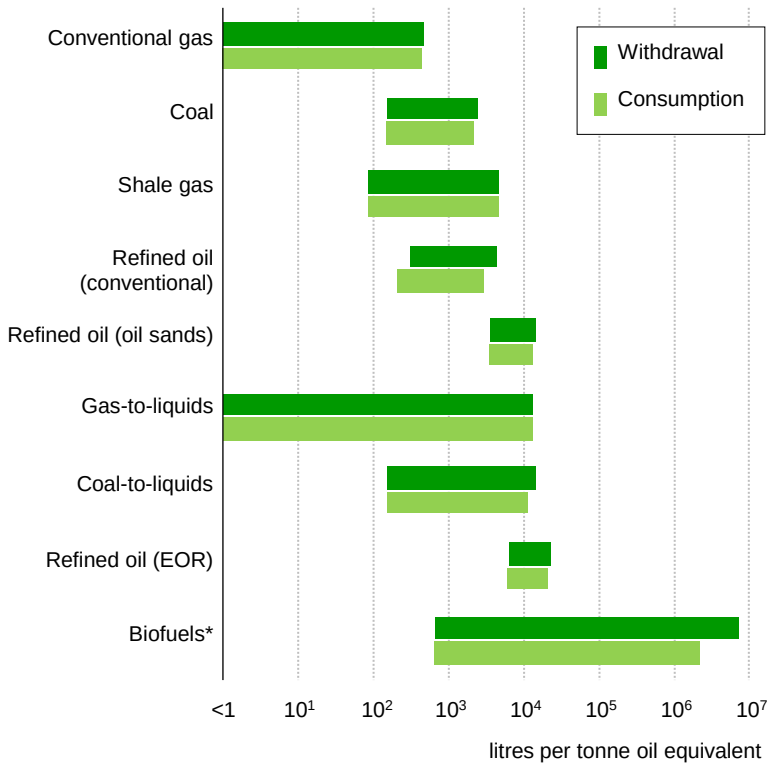
Water withdrawal by energy source



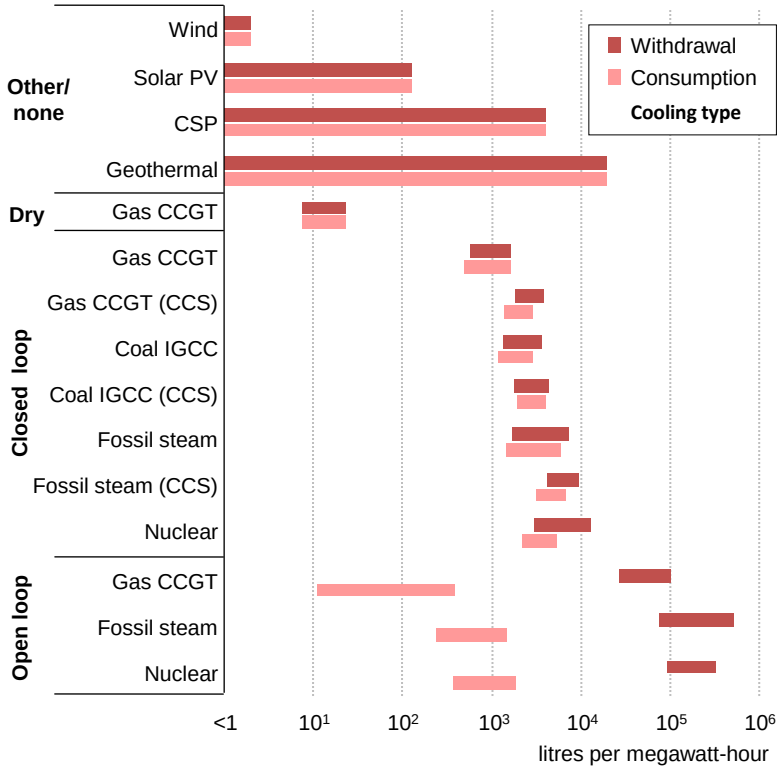
Source: IEA *World Energy Outlook 2012* New Policies Scenario

Water for energy

Primary energy production



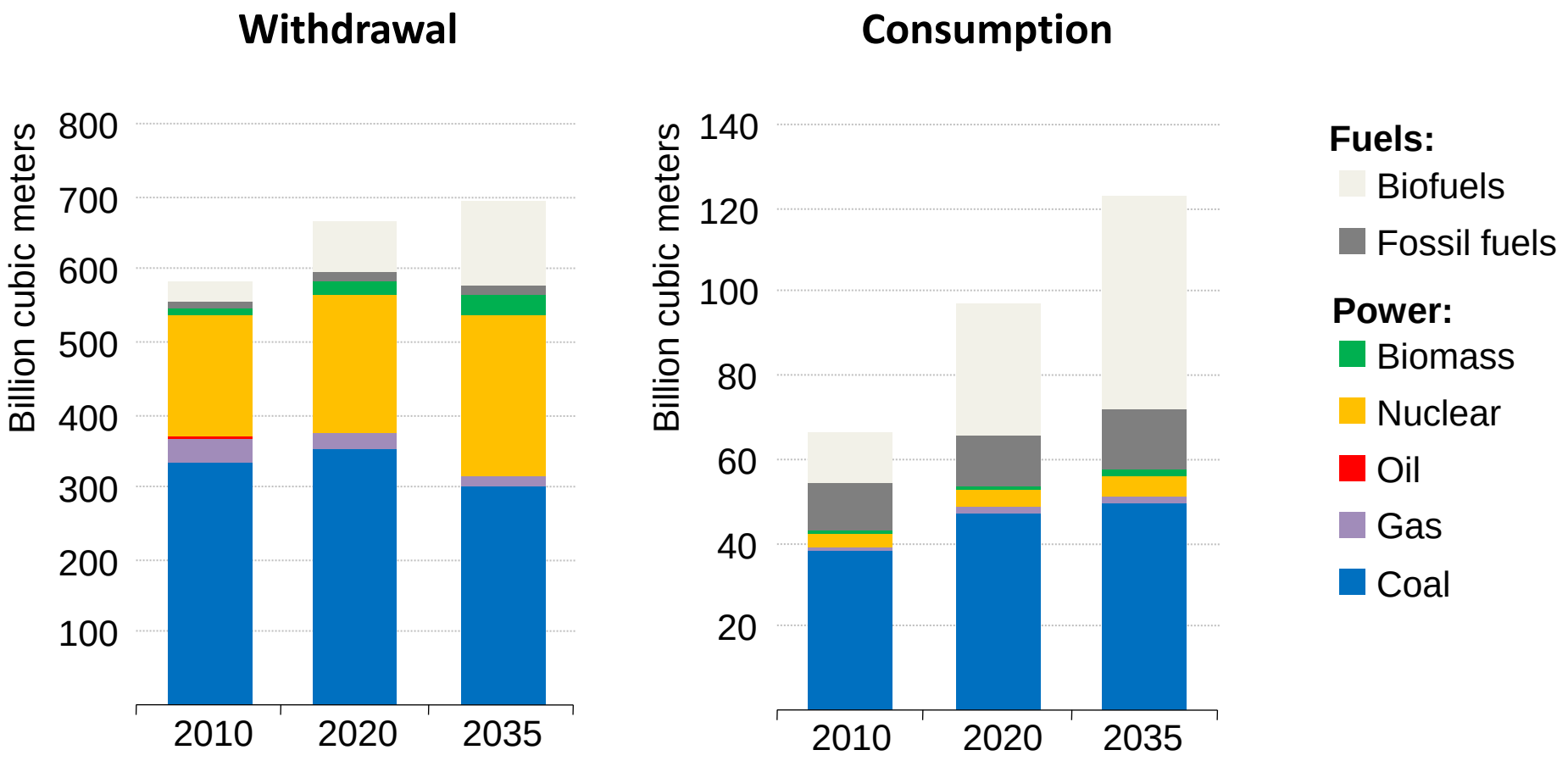
Electricity generation



Note: Ranges shown for primary energy production are “source-to-carrier”; ranges shown for electricity generation are for power plant operations only.

Sources: Schornagel et al. (2012); Macknick, et al. (2011); US DOE/NETL (2007 and 2011); US DOE (2006); Gleick (1994); IEA analysis.

Water for energy production in the WEO-2012 New Policies Scenario



Source: IEA *World Energy Outlook 2012* New Policies Scenario

Energy sector options to mitigate water constraints

- Deploy energy sources that involve zero or negligible water use, such as wind or solar PV.
- Fit thermal power plants with more advanced cooling systems.
- Build higher-efficiency thermal power plants, which are also more water-efficient.
- Grow biofuel crops in areas that rely predominately on rain rather than on irrigation.
- Encourage the use of non-freshwater sources.
- Employ water re-use and re-cycling technologies.

Consider the trade-offs: increased cost, location of energy production facilities and energy output penalties

Policy implications

- Requirements on water-efficient cooling
- Water-related requirements for unconventional oil and gas extraction
- Water/climate nexus consideration in permitting new power plants
- Contingency plans in case of water stress

- Other (possible work area for the IEA climate team)

IEA Energy Security-Climate Nexus

- **Launched in 2012**
- **2 meetings per year:**
  - Implications for Business (November 2012)
  - Cities and Insurance (June 2013) – together with the UK Foreign and Commonwealth Office
  - Electricity Sector Resilience (November 2013)
  - Water and Energy (June 2014) – together with WBCSD
- **5th Nexus Forum: Policy responses (November 4)**
  - High level panel: Emerging policy space - energy sector adaptation to climate change
  - Policies and practices to enhance resilience of the energy system to gradual and extreme climate changes
  - Incorporating climate risks in insurance and investment policies
  - International, national and local tools and policies: what is the appropriate level?

  - Looking for government participants;
  - Looking for inputs for the follow up analytical work at the IEA

THANK YOU

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