

THE UNITED NATIONS WORLD WATER DEVELOPMENT REPORT 2014: WATER AND ENERGY

(TECHNICAL DOCUMENT)

The Challenge to Come: Meeting Growing Demands

Demands for freshwater and energy will continue to increase significantly over the coming decades to meet the needs of growing populations and economies, changing lifestyles and evolving consumption patterns, greatly amplifying existing pressures on limited natural resources and on ecosystems. The resulting challenges will be most acute in countries undergoing accelerated transformation and rapid economic growth, or those in which a large segment of the population lacks access to modern services.

Global water demand (in terms of water withdrawals) is projected to increase by some 55% by 2050, mainly because of growing demands from manufacturing (400%), thermal electricity generation (140%) and domestic use (130%). As a result, freshwater availability will be increasingly strained over this time period, and more than 40% of the global population is projected to be living in areas of severe water stress through 2050.

There is clear evidence that groundwater supplies are diminishing, with an estimated 20% of the world's aquifers being over-exploited, some critically so. Deterioration of wetlands worldwide is reducing the capacity of ecosystems to purify water.

Global energy demand is expected to grow by more than one-third over the period to 2035, with China, India and the Middle Eastern countries accounting for about 60% of the increase. Electricity demand is expected to grow by approximately 70% by 2035. This growth will be almost entirely in non-Organisation for Economic Co-operation and Development countries, with India and China accounting for more than half that growth.

What Rising Energy Demand Means for Water

Energy comes in different forms and can be produced in several ways, each having a distinct requirement for—and impact on—water resources. Thus, as a country's or region's energy mix evolves, from fossil fuels to renewables for example, so too do the implications on water and its supporting ecosystem services evolve. Approximately 90% of global power generation is water intensive.

The International Energy Agency estimated global water withdrawals for energy production in 2010 at 583 billion m³ (representing some 15% of the world's total withdrawals), of which 66 billion m³ was consumed. By 2035, withdrawals could increase by 20% and consumption by 85%, driven via a shift towards higher efficiency power plants with more advanced cooling systems (that reduce water withdrawals but increase consumption) and increased production of biofuel. Local and regional impacts of biofuels could be substantial, as their production is among the most water intensive types of fuel production.

The incentives to increase efficiency facing the two domains are asymmetrical: energy users have little or no incentive to conserve water due to zero or low prices, but water users normally do pay for energy, even though prices may be subsidized. Water and energy prices are strongly affected by political decisions and subsidies that support major sectors such as agriculture and industry, and these subsidies often distort the true economic relationship between water and energy. Particularly for water, price is rarely a true reflection of cost—it is often even less than the cost of supply. A coherent policy—which is to say an adequate public response to the interconnectedness of the water, energy and related domains—requires a hierarchy of actions. These include:

- Developing coherent national policies affecting the different domains
- Creating legal and institutional frameworks to promote this coherence
- Ensuring reliable data and statistics to make and monitor decisions
- Encouraging awareness through education, training and public information media
- Supporting innovation and research into technological development
- Ensuring availability of finance for sustainable and mutually compatible development of water and energy.
- Allowing markets and businesses to develop

Together these actions make up the *enabling environment* necessary to bring about the changes needed for the sustainable and mutually compatible development of water and energy. The international community can bring actors together and catalyse support for national, subnational and local governments as well as utility providers, who have a major role in how the water–energy nexus plays out at the national and local levels.

Source: Excerpt from WWAP (United Nations World Water Assessment Programme), *The United Nations World Water Development Report 2014: Water and Energy*. Paris, UNESCO. <http://unesdoc.unesco.org/images/0022/002257/225741e.pdf>

Questions for The United Nations World Water Development Report 2014: Water and Energy

LEVEL 1

General Understanding

- What issue is being presented? How do you know?
- Who are the authors of this piece? What does this tell us about the audience?

Key Details

- What is happening in regard to global water demand?
- Who will be most impacted by the growing demands for freshwater and energy?
- Which countries are expected to grow the most in terms of water usage?
- What are the main causes of increased water demand?
- The excerpt talks about two domains in Section 2. What are they?

LEVEL 2

Vocabulary

- What is the tone of this text? Point to specific words or phrases that reveal this.
- Why do the authors say the world's water sources are "over-exploited"? What does *exploit* mean in this context?
- Explain the difference between withdrawals and consumption.
- What is a subsidy? Why is this significant to the meaning of the text, in particular Section 2?
- According to the text, what does *coherent* mean?

Structure

- Skim the headers of each section. What purpose do they serve? How do they help the reader understand the text better?
- What do you notice about the format of Section 2? What is the effect of including a bulleted list amongst paragraphs?

Author's Craft

- How do the authors of the text use statistics to support their claims? Why do you think they use percentages to illustrate their point?
- Describe the cause-and-effect relationship between water and energy. How does this help to illustrate the report's purpose?

LEVEL 3

Author's Purpose

- What is the authors' attitude toward subsidies? How do you know?
- What reason does the report give for consumers not knowing how much water really costs? What can you infer about why the extent to which certain industries use water remains unclear to consumers?
- What do the authors mean by an *enabling environment*? What would this look like? Use evidence from the text to support your thinking.

Intertextual Connections

- Compare and contrast the "UNESCO Water Report" to Al Gore's blog in The Huffington Post (www.huffingtonpost.com/al-gore/antarctic-glaciers-and-th_b_1254304.html). Are these two articles similar or different? How?

LEVEL 4

Opinion With Evidence or Argument

- Research why China and India account for more than half of the estimated growth in water use. What is, or is not, happening in these countries that supports this claim?
- Evaluate the water situation in your town, city, and or state. What is the current water and energy status? How does the article support or disclaim your town's, city's, or state's situation?
- Research and evaluate different options available to conserve water and energy. Which options are the most efficient? Why?