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# Main Messages from the World Water Development Report 2014 (WWDR 2014)

## Eight Messages about Water and Energy

**1. Demand for energy and freshwater will increase significantly in the coming decades. This increase will present big challenges and strain resources in nearly all regions, especially in developing and emerging economies.**

Worldwide energy demand is projected to grow by more than one-third over the period to 2035. Demand for electricity is expected to grow by 70% over the same period. 90% of global power generation is water-intensive.

Global water demand in terms of water withdrawals is projected to increase by some 55% by 2050 due to growing demands from manufacturing, thermal power generation (mainly from the expansion of coal and gas powered plants) and domestic use. Agricultural water consumption alone, which already accounts for 70% of groundwater withdrawals, is expected to increase by about 20% globally by 2050 unless efficiencies improve.

The challenge will be greatest in developing and emerging economies, where agriculture, industry and urban areas are often growing at an unprecedented pace. Worldwide, 1.3 billion people currently live without electricity, 780 million lack access to safe drinking water, and 2.5 billion are without sanitation.

**2. Water and energy supply and provision are interdependent. Choices made in one domain impact the other, for better or for worse.**

Water is required to produce nearly all forms of energy. Water can be a limiting factor in the development of hydropower, thermal electricity generation and biofuels. Decisions concerning energy production need to take account of the limits of water resources, the water requirements of other users (agriculture, cities, industry) and the need to maintain healthy ecosystems. This is not currently the norm.

Energy is needed at all stages of water extraction, treatment and distribution. Water supply and sanitation services, as well as irrigation, are therefore dependent upon an affordable and reliable source of energy.

There is an increasing risk of conflict between power generation, other water users and environmental considerations. Thermal power generation accounts for roughly 80% of global electricity production and is responsible for one half of all water withdrawals in several developed countries. Hydroelectricity, which can also require abundant water supplies, provides an additional 15%. Trade-offs can sometimes be reduced by technological advances, but these may carry trade-offs of their own.

The evolution of the global energy mix – i.e., the distribution of the various energy sources being used – will have an unprecedented impact on water

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resources and other users. The decisions made today about how to increase energy production will determine the sustainability of freshwater resources tomorrow.

**3. Policy-makers, planners and practitioners can take steps to overcome the barriers that exist between their respective domains. Innovative and pragmatic national policies can lead to more efficient and cost effective provision of water and energy services.**

Regulation and legislation regarding energy generally focuses on production and distribution, whereas for water the focus is mainly on extraction, use and discharge. The size of infrastructure and the geographic scales spanned by the service delivery systems can also be quite different.

Recognition of the interconnectedness between water and energy has led some observers to call for a greater level of integration between the two domains. Although this may be possible and beneficial under certain circumstances, simply increasing the level of collaboration and coordination in the development of policy responses can greatly help to optimize investments, cut inefficiencies and better manage trade-offs.

**4. The price of energy and water services can better reflect the cost of their provision and socio-environmental impacts without undermining the basic needs of the poor and the disadvantaged.**

Appropriate pricing structures can provide sufficient revenues for continued operation and maintenance. There are opportunities in many cases for adjusting tariff structures and targeting subsidies to protect the poorest and most deserving consumers, while reducing some of the worst distortions and waste caused by subsidy dependency.

This is more easily done with energy than with water. Energy is seen as big business compared to water, and can command a great many more resources of all kinds. Water is considered as a “gift of nature”, with supply and sanitation recognized as a human right.

**5. The private sector can play a greater role in water and energy infrastructure investment, maintenance and operation.**

Traditionally, the public sector has provided the bulk of both water and energy infrastructure, but the sums involved are often too large for the public purse to bear alone. For example, it has been estimated that $103 billion per year would have been required to finance water, sanitation and wastewater treatment through to the end of the MDG cycle in 2015. According to the International Energy Agency (IEA) an additional $49 billion per year will need to be invested to achieve universal energy access by 2030.

Creating an environment that enables private investment in infrastructure in tandem with the public sector to promote sustainable service delivery, reduce investment inefficiencies and help utilities to move towards cost recovery can help close the infrastructure financing gap.

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**6. Private sector involvement and governmental support for research and development are crucial for developing alternative, renewable and less water intensive energy sources.**

From a water resources perspective, solar photovoltaic and wind are the most sustainable sources for power generation. However, in most cases the intermittent service provided by solar photovoltaic and wind needs to be compensated for by other sources of power (which do require water) to maintain load balances.

Support for the development of renewable energy, which remains far below that for fossil fuels, will need to increase dramatically before it makes a significant change in the global energy mix, and by association, in water demand.

Direct use of geothermal energy is underdeveloped and its potential is greatly underappreciated. It is climate independent, produces no greenhouse gas emissions, does not consume water, and its availability is infinite at human time scales.

**7. Water and energy are both at the heart of sustainable development and need to be recognized as such.**

Many internationally agreed development goals, including nearly all the Millennium Development Goals, depend on major progress in access to safe water, adequate sanitation and reliable sources of energy.

Separate sustainable development goals dedicated to water, food and energy security can be independent of each other but should be closely related and coordinated in order to maximize co-benefits in the most cost effective manner possible.

**8. Decisions about water and energy sharing, allocation, production and distribution have important social and gender equality implications. Water and energy governance needs to be gender-sensitive.**

Monitoring progress requires the generation and analysis of gender-disaggregated data, which considers not only the existence of differences between the services and benefits provided to men and women, but also the causes and impacts of these differences.

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