



INTRODUCTION

Access to reliable, sustainable, and affordable energy and water is fundamental to quality of life. About 1 billion people globally still do not have access to electricity, over 2 billion cook indoors with biomass of some kind, and almost 800 million have no access to improved, potable water. The proposed Energy & Water Poverty (EWP) consortium will research how to help bring millions out of energy and water poverty while also improving education, immigration, and empowerment of women.

The latest film from Bureau of Economic Geology Director Dr. Scott W. Tinker, *Switch On*, powerfully communicates its message through real-world stories of urban and rural communities, providing a realistic depiction of what life is like when people struggle with energy and water poverty. More broadly, this work shines a light on the broader global impacts of energy access and inequality that will inform the research of EWP.

The developed countries of the world built their economies on energy, mostly relying on coal for power and oil for transportation. As highly populated countries in Asia (e.g., China and India) and in other parts of the world (e.g., countries in Africa and Latin America) emerge economically, they will also build their economies on energy. Through this energy and the economic engine it fuels, societies will be able to provide cleaner and safer air, soil, and water for their citizens. Choices about their specific energy mixes, and the technologies used in



developing countries, vary by resources and other geopolitical factors and have a profound impact on reducing energy poverty and improving the local and global environment. Those choices, in turn, lead to significant potential effects on usable water resources and access.

EWP aims to understand the energy and water resources available and to provide sustainable and economical options to decrease energy and water poverty. These options will be geography-specific, tailored to communities in developing countries. The Bureau's cross-disciplinary, integrated research, with a systematic engineering-scientific-economic approach, will identify solutions that address the energy, economics, and environmental challenges of our society, within what Dr. Tinker calls the "Radical Middle."

THE VISION

The Bureau of Economic Geology plans to create a research consortium that examines global energy and water poverty. This will not be an advocacy group; the research will be objective and nonpartisan. The goal is to conduct



scientific research that identifies potential resources and develops fundamental data that can be used to build models and provide analytics that lead to more reliable, sustainable, and affordable energy and water in communities, cities, and countries globally.

The Bureau's mission is to serve society by conducting objective, impactful, and integrated geoscience research on relevant energy, environmental, and economic issues. The research approach for this consortium will look at supply-chain options for energy and water while considering the environmental and health issues of the local population, and the interdependency of energy and water, to develop structured solutions adaptable to different geographies. With a structured framework defined, the consortium will then select specific geographies for more in-depth case studies and analysis.

THE DIFFERENTIATED VALUE PROPOSITION

The Energy & Water Poverty consortium proposes to:

- **Improve synergy and collaboration** by bringing together cross-disciplinary and disparate sources of knowledge and expertise
- Enable local communities with **actionable solutions** by focusing research on **specific case studies**
- Share progress and ongoing initiatives with members through newsletters and workshops, **enabling networking**

CASE STUDY POSSIBILITIES

After the overarching framework is defined, the Bureau will identify specific focus areas. Case studies may include the following:

- 1 Considering resources, infrastructure, and political frameworks and analyzing optimal energy-option scenarios for a defined geographic region, community, city, country, or continent. For example, what characteristics should influence the decision between utility- or distributed-scale energy infrastructure?
- 2 Can mobile phone technology be used to capture, monitor, and model energy and water use to ensure sustainable groundwater development?
- 3 In Texas along the Rio Grande, hundreds of thousands of people live in colonias (neighborhoods) without basic electricity, water, or wastewater infrastructure. Understanding how to build distributed systems there could inform the discussion on improving living conditions not only in the colonias but in similar regions globally.
- 4 Examining the role of liquefied petroleum gas (LPG) in reducing energy poverty in specific Southeast Asian countries. What are the economic and energy impacts of an LPG market for the target economy and what are the additional opportunities and risks of including LPG as a part of the energy mix for a developing country?

and facilitating knowledge-sharing among stakeholders—including local governments, technology providers and investors—to maximize the impact of the research and to promote collaboration

- Provide **user-friendly and open-access resources** that promote educational programs for public engagement and informed decision making, which include **organized outreach work** that will connect with communities in energy poverty regions



- 5 How can China, India, and other major economies be accelerated away from coal toward other energy options? For example, what is needed for Vietnam to transition from its planned coal-based electricity to other sources while addressing its overall energy demand? Or for India to move more quickly away from coal? A study might look into the economic feasibility of natural gas as a meaningful, cleaner option for such energy mixes.
- 6 With a long history of operating in many developing countries, and a business need to continue accessing reserves, oil and gas companies have led the way in tackling energy poverty. How will they continue in the face of public concern?

There would also be opportunities for individual member companies to initiate sponsored research projects with a defined scope of work and set of deliverables specific to the needs of the company.

CONSORTIUM STRUCTURE AND LEADERSHIP

The membership fee for the consortium will be \$30,000 per year. The consortium leadership will include the following researchers:



Dr. Bridget Scanlon, an internationally known geologic researcher with experience in a multitude of water and energy topics. She is a member of the National Academy, and brings over 30 years of experience to the team.



Dr. Ning Lin, an energy economist with expertise in supply chain, project economics, and modeling. She has over 15 years of energy industry experience.



Dr. Michael Young, a senior research scientist with over 30 years of groundbreaking research experience. His international work in water and energy poverty will enhance the foundation of the consortium's leadership team.



Dr. Scott Tinker has a passion for addressing integrated energy, economic, and environmental challenges in society. With the recent release of his newest film, *Switch On*, which examines global energy poverty, he brings unique insights to the research team.