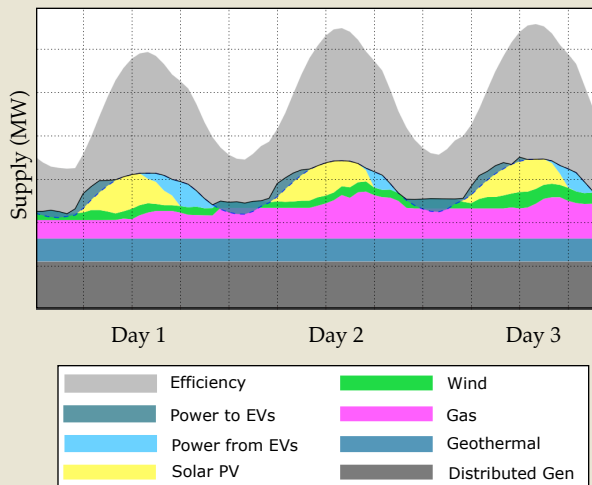


Next Generation Utility: The NGU system is based on five elements: energy efficiency, renewable energy, distributed generation, demand response, and energy storage, especially from electric vehicles.



Dynamics of a low-carbon system: The integrated model provides an hourly examination of how the elements of NGU work together to meet demand. This 3-day summer supply profile illustrates the effects of efficiency, renewable energy, distributed generation, and storage from electric vehicles.

ELECTRICITY MUST BE DECARBONIZED

THE CURRENT ELECTRIC SYSTEM IS UNSUSTAINABLE

Fossil fuel combustion for electricity generation accounts for 40% of U.S. CO₂ emissions, and is a major contributor to global climate change. In order to stabilize the climate, experts have called for an 80% reduction in carbon emissions (below 1990 levels) by 2050. To meet these targets and satisfy rising energy demands, energy efficiency and low-carbon energy sources are critical.

A RELIABLE, LOW-CARBON ELECTRIC SYSTEM IS FEASIBLE

An intelligently integrated combination of energy efficiency, renewable energy, distributed generation, demand response, and energy storage, especially from electric vehicles, can meet our need for reliable, low-carbon electricity. RMI's Next Generation Utility (NGU) initiative quantifies the potential of these elements and models how they interact on an hourly basis to meet demand.

A CREDIBLE LOW-CARBON VISION IS NEEDED

ESTIMATING THE POTENTIAL OF INDIVIDUAL TECHNOLOGIES

RMI is conducting both primary and secondary research to determine the technical and economic implications of each of the NGU elements. The research combines RMI's three areas of expertise: efficient buildings, advanced vehicles, and the electric power industry.

COMBINING TECHNOLOGIES TO MEET ELECTRIC DEMAND

RMI is building a simplified production and dispatch model to demonstrate that a combination of the NGU elements can meet electric demand at an hourly level. The model utilizes real supply & demand data and the results of area research to quantify the resource adequacy, cost, reliability, and CO₂ footprint of NGU scenarios.

IMPLEMENTING SOLUTIONS THROUGH COLLABORATION

Redefining the electric system is a significant challenge that RMI cannot overcome alone. We are therefore working collaboratively with electric utilities and regulatory bodies to verify our research and apply it to real-world systems. With this insight, we will apply our findings to electric systems across the country to define regionally appropriate solutions

INTELLIGENT PLANNING TOWARDS THE LOWEST COST SOLUTION

Demand for clean electricity is growing rapidly, yet low-carbon technologies present new challenges for maintaining electric system reliability while keeping costs low. Many organizations are working to incrementally adapt the current system to emerging technologies. RMI, however, envisions a wholly integrated future system that utilizes dynamic demand- & supply-side resources to provide reliable, low-cost, low-carbon electricity. This clear vision will enable utilities and regulators to create a roadmap that ensures the lowest-cost transition to clean electricity.

For more information, please contact us at ert@rmi.org