California is a global leader in advancing policies to reduce greenhouse gas (GHG) emissions. As the state forges into new territory by decarbonizing its energy sector, new challenges are rapidly arising.

In a three-part policy forum series this fall, the UC Davis Policy Institute for Energy, Environment and the Economy will spotlight the challenges and opportunities for California as it transitions to a renewable energy future. Featuring panelists from government, industry and academia, the forums will be held at the University of California Sacramento Center, located near the State Capitol.

**The Challenge:**

The California Independent System Operator (CAISO) recently identified the need for additional flexible capacity, demand response and energy efficiency to accommodate the large amount of variable renewable generation projected to come online by 2020. To visualize these challenges, the CAISO developed a graph which has become widely known as the “duck curve” (Figure 1). The graph depicts the “net load” of actual demand on the CAISO system minus wind and solar generation under specific projected conditions. The graph has been widely utilized to illustrate the resulting need for resources that can come online or ramp quickly as the sun goes down and large quantities of solar PV come offline in unison.

![Figure 1. The Duck Curve - California ISO Demand Response and Energy Efficiency Roadmap: Maximizing Preferred Resources, Dec. 2013](image)
The UC Davis Policy Institute Forum Series:

Policies are already being developed to address the challenges of integrating large capacities of intermittent renewables while expanding the renewables portfolio standard (RPS) beyond 33 percent. “Beyond 33 Percent: California’s Renewable Energy Future, From Near-Term Solutions to Emerging Technologies” will explore the opportunities and challenges present with the implementation of variable renewable energy sources in California, and potential solutions across various disciplines to these challenges.

The first forum, Renewables Beyond 33 Percent, will set the stage by outlining the challenges California faces with the anticipated amount of variable renewable resources contracted to come online by 2020. It will discuss measures that can be taken to increase reliability, the California Public Utilities Commission’s new flexible reserve requirements, and a review of recent studies that offer solutions while increasing renewable energy penetration over time.

The second forum, Near-Term Developments: The Role of Storage, Smart Grid, EVs, Distributed Generation, and Zero-Net Energy, will identify opportunities and challenges with the deployment of grid storage, smart grid solutions, distributed generation and ZNE. By employing the technologies and concepts behind zero-net energy communities, smart grid technologies, storage and distributed generation, California may be able to increase grid reliability while reducing load and greenhouse gas emissions. This forum will identify the potential for each of these technologies along with their associated pros and cons in helping to smooth California’s transition to its renewable future.

The third forum, Emerging Renewable Technologies, will discuss the economic and technical viability of emerging technologies that may help increase reliability and renewable energy in California’s portfolio. Presenters and panelists will discuss these options and their associated costs and benefits in the areas of offshore wind, geothermal, small-hydro, and biomass energy.

Co-sponsoring the forum series with the UC Davis Policy Institute is the UC Davis Energy Institute.

Forum Dates:

Renewables Beyond 33 Percent
October 17, 2014 11:00 am - 1:00 pm PDT
UC Center Sacramento

Near-Term Developments: The Role of Storage, Smart Grid, EVs, Distributed Generation, and Zero-Net Energy
November 17, 2014 11:00 am - 1:00 pm PST
UC Center Sacramento

Emerging Renewable Technologies
December 10, 2014 11:00 am - 1:00 pm PST
UC Center Sacramento

The Intersection of Transportation and Renewable Energy
January 21, 2014 11:00 a.m. – 1:00 p.m. PST
UC Center Sacramento