

**Technical Track Breakout Session 1:  
Track 3: Applications of Efficient Use of  
Biomass for Heat and Power**

**July 27, 2011**

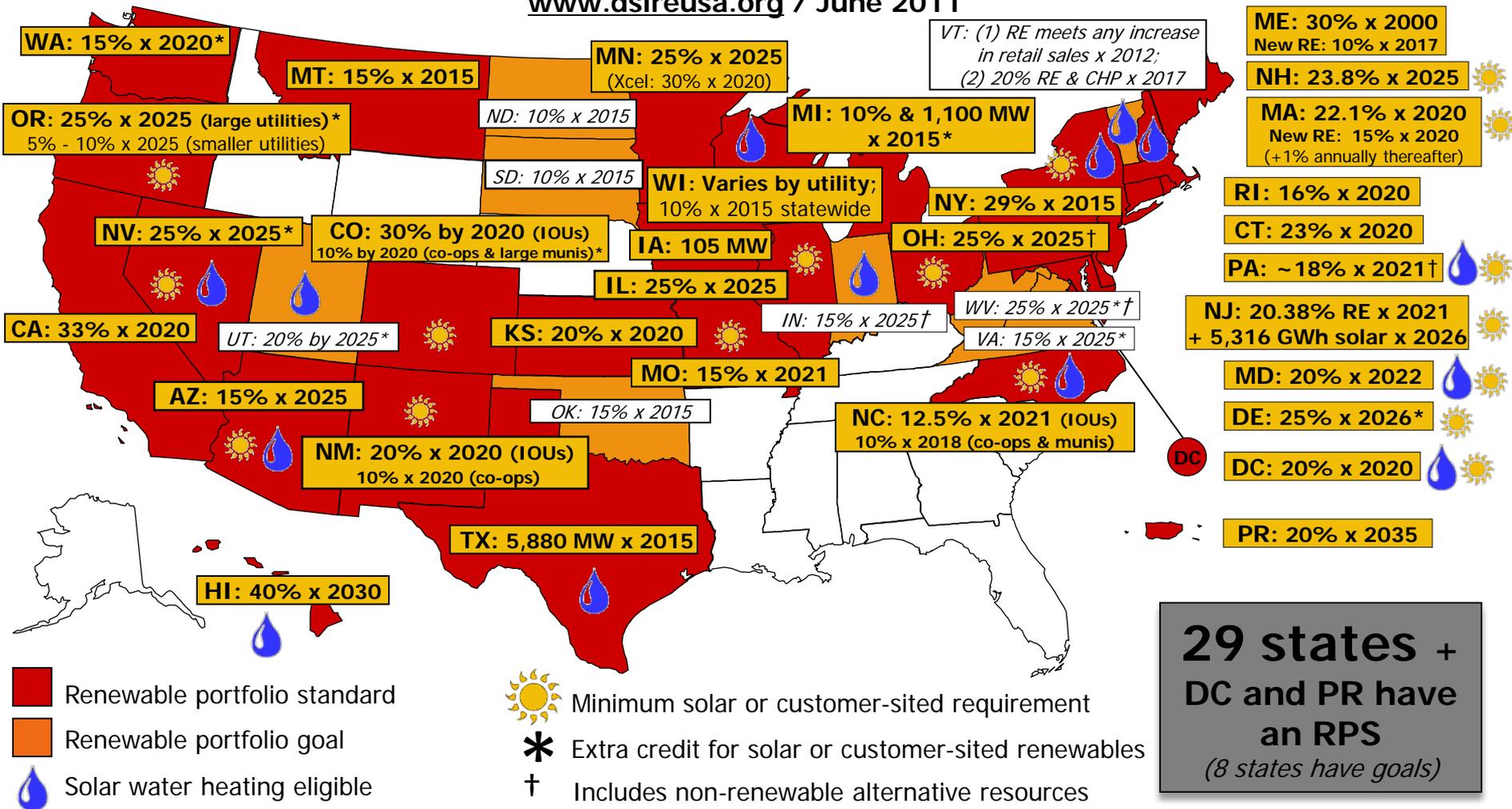
**Elliott Levine,  
Technology Manager  
DOE Biomass Program**

- Biomass CHP systems: 60-85%
- Direct-fired power plants (without waste heat capture): 20-30%
- Co-firing Biomass with coal: 25-35%
- Integrated gasification combined cycle (under development): 50-65%

\* Information from various sources

## RPS Policies

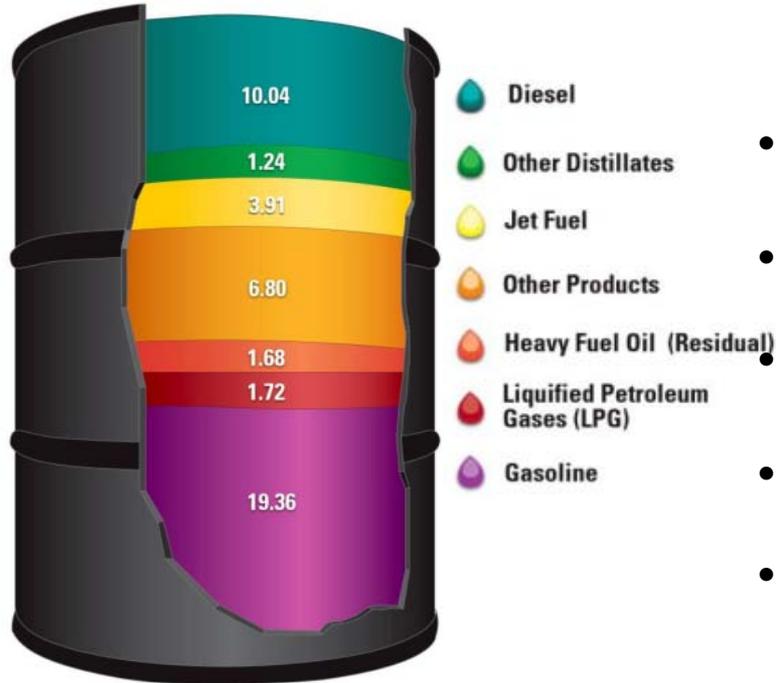
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**29 states + DC and PR have an RPS**  
(8 states have goals)

# Replacing the Whole Barrel

## Products Made from a Barrel of Crude Oil (Gallons) (2009)



- Greater focus needed on RDD&D for a range of technologies to displace the entire barrel of petroleum crude
- Reducing dependence on oil will require developing technologies to replace other components of the barrel, such as diesel, jet, heavy distillates, and a range of chemicals and products
- Cellulosic ethanol displaces light duty **gasoline** fraction only
- U.S. spends more than \$1,197M each day on crude oil imports\*
- Oil accounts for 94% of transportation fuel use (EIA), accounting for over 70% of total U.S. oil consumption.
- Nearly 22.3M barrels of oil are required every day to fuel ~247M light-duty vehicles on the road\*
- Only about 40% of a barrel of crude oil is used to produce light duty petroleum gasoline

Source: Energy Information Administration, "Oil: Crude Oil and Petroleum Products Explained" and AEO2009, Updated February 2010, Reference Case.  
\*American Petroleum Institute.