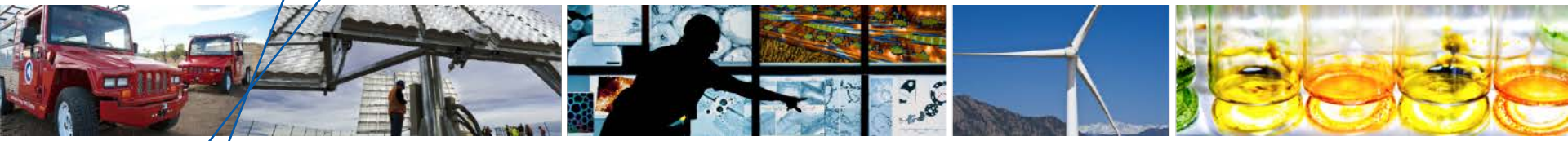
Energy-Climate-Water-Land Nexus: A life cycle perspective

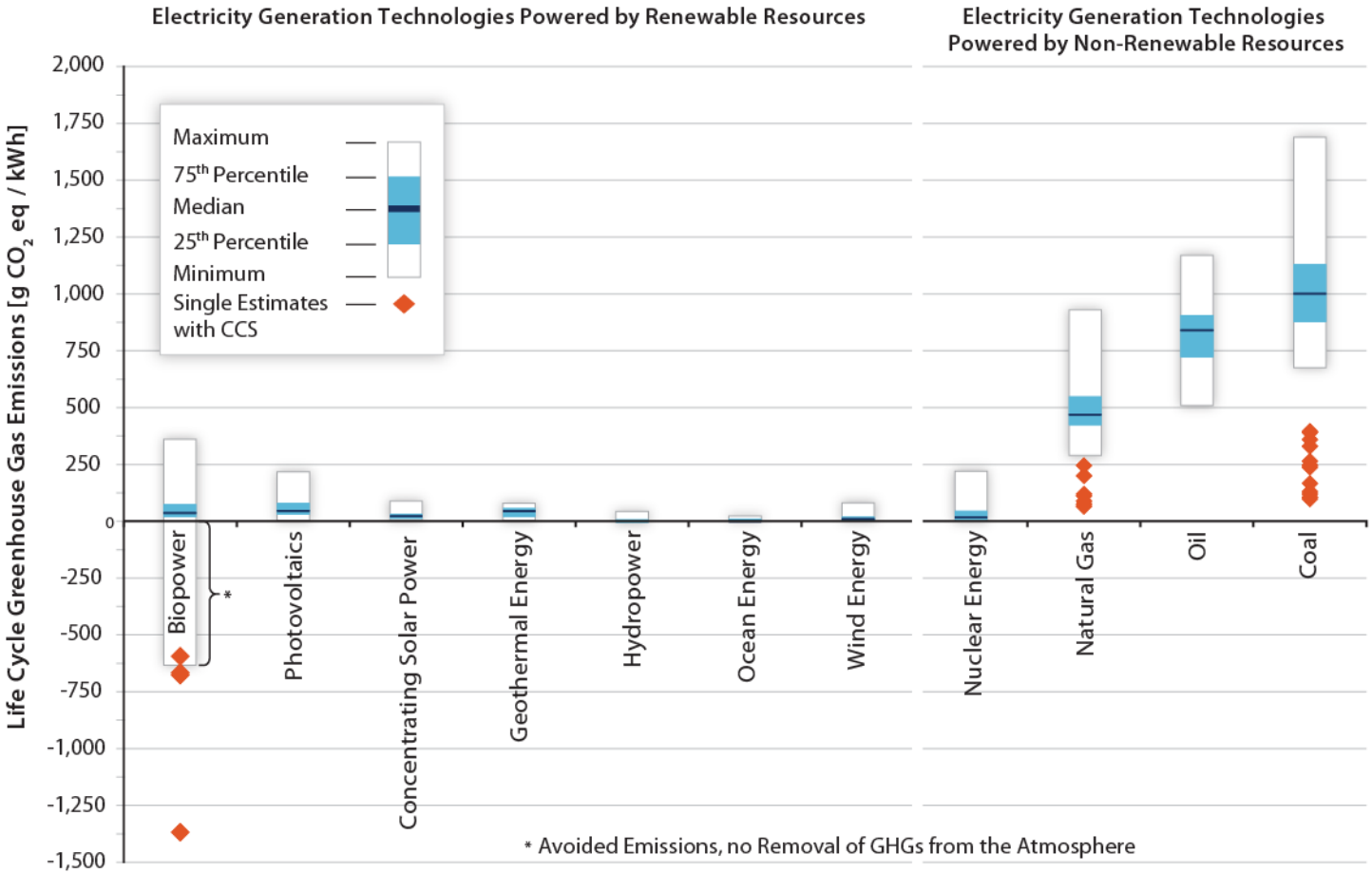


March 12, 2014

JISEA Annual Meeting

Garvin Heath, PhD
National Renewable Energy Laboratory

Energy-Climate



Count of Estimates	222(+4)	124	42	8	28	10	126	125	83(+7)	24	169(+12)
Count of References	52(+0)	26	13	6	11	5	49	32	36(+4)	10	50(+10)

Next steps:

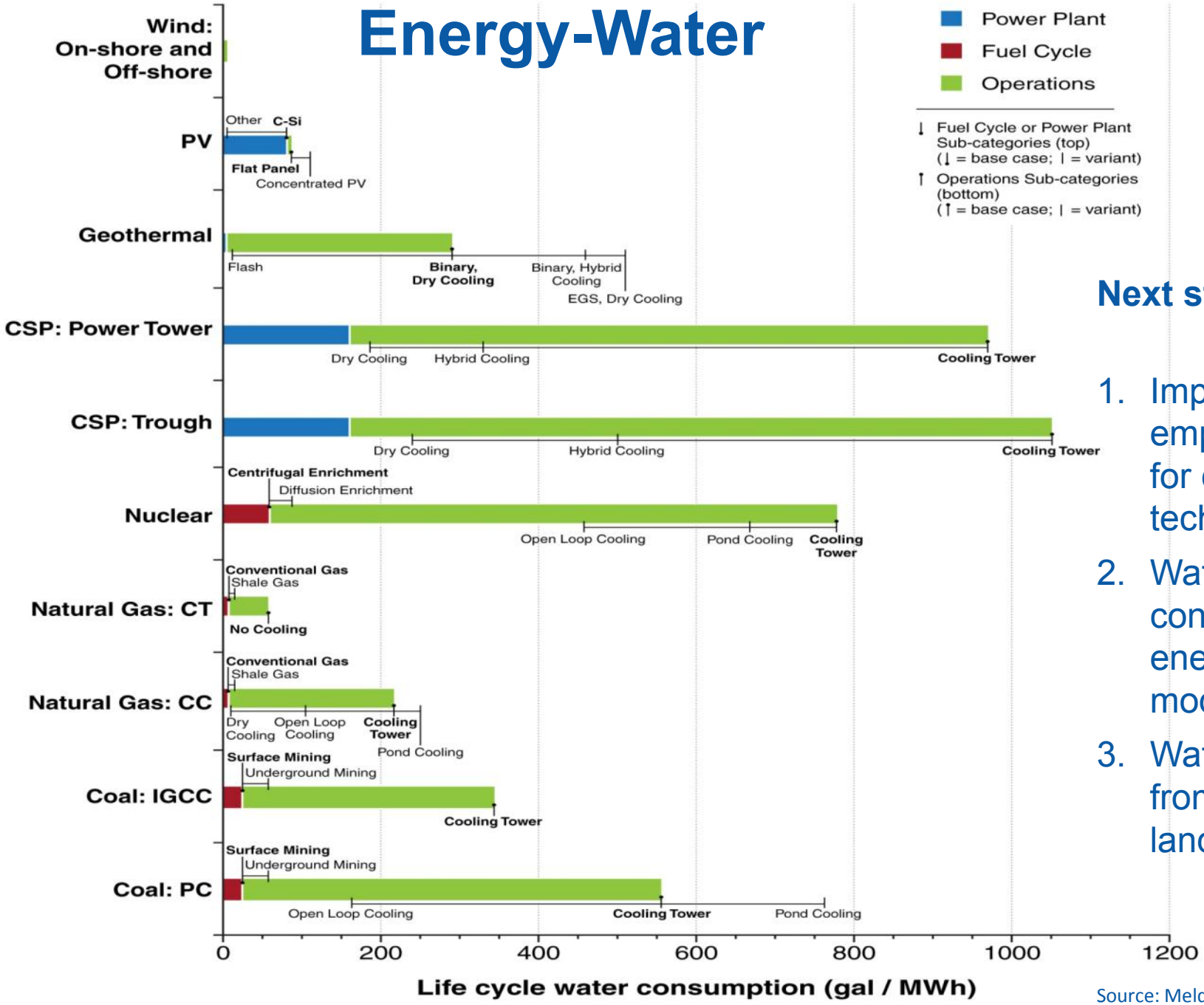
1. NG methane emissions
2. Market-driven effects of large energy transitions
3. Projections based on tech. change

NREL NATIONAL RENEWABLE ENERGY LABORATORY

ipcc INTERGOVERNMENTAL PANEL ON climate change

Source: SRREN

Energy-Water

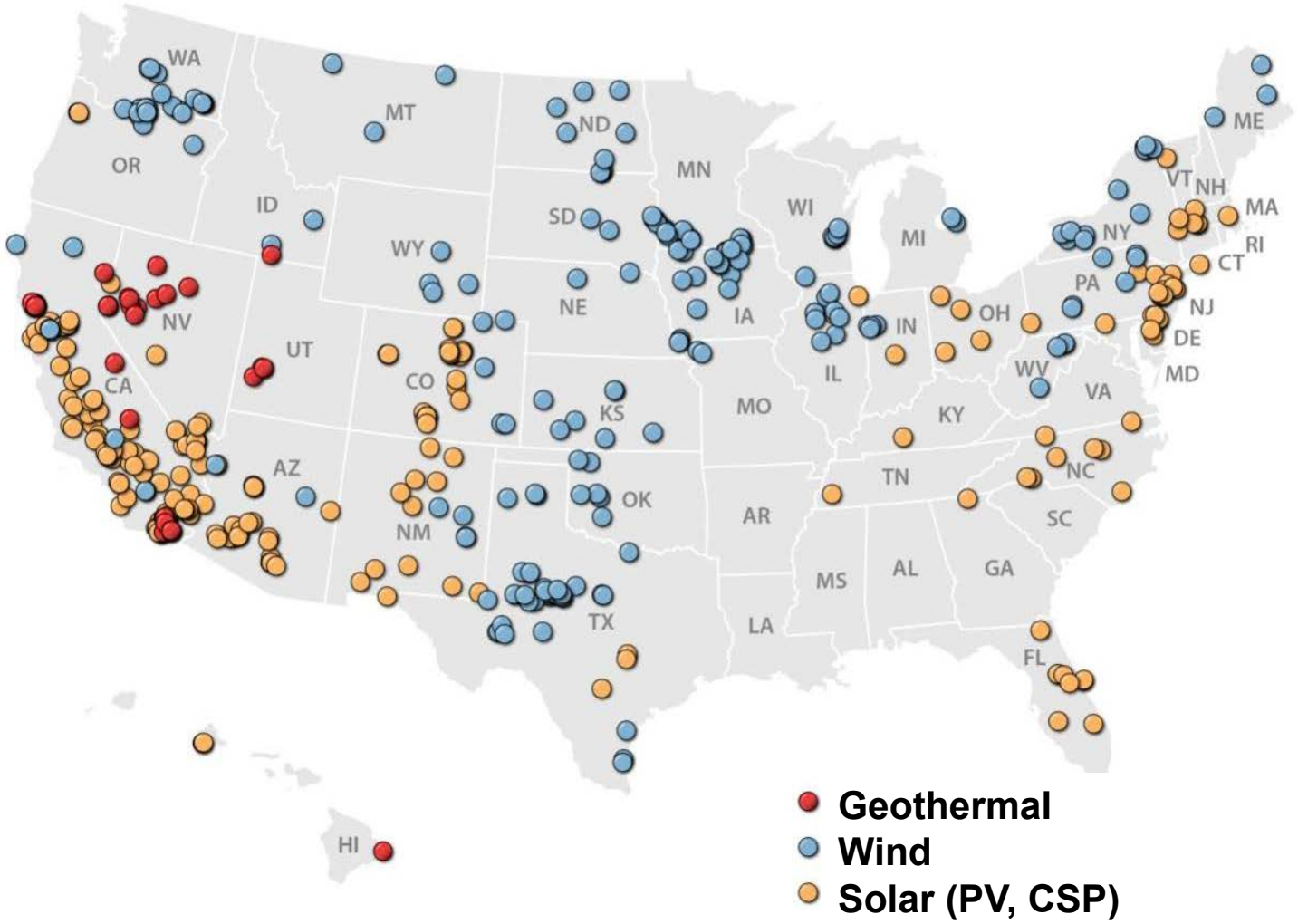


Next steps:

1. Improve empirical basis for certain technologies
2. Water as constraint in energy sector modeling
3. Water demands from current land use

Source: Meldrum et al., 2013

Energy-Land



Next steps:

1. NG life cycle land use: first case study on Barnett
2. Life cycle land use for other key technologies

Ong et al. (EPRI) 2013