Los Angeles Department of Water & Power

City of Los Angeles
100% Renewable Energy Study

Advisory Group Kick Off Meeting

June 23, 2017

Putting Customers First

LADWP's Power System key priorities

LADWP is committed to meeting the future energy needs of LADWP customers in a manner that balances three key objectives:

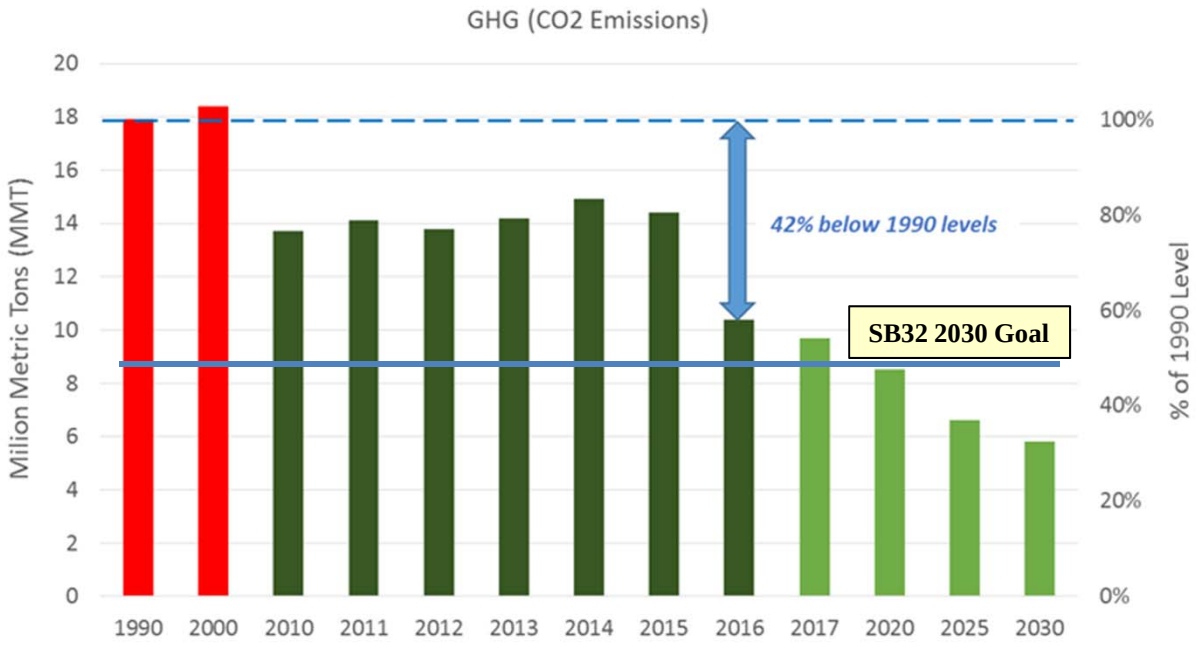
1. Safe and reliable electric service
2. Competitive electric rates consistent with sound business principles
3. Responsible environmental stewardship exceeding all regulatory obligations

LADWP ACCOMPLISHMENTS AND GOALS

Year	2006	2010	2016	2020	2025	2030	2036
California RPS	-	20%	25%	33%	45%	50%	-
LADWP'S RPS Target	6%	20%	29%*	*39%*	*50%*	*55%*	*65%*

Renewable Progress:

- 961 MW large solar
- 240 MW BTM solar
- 996 MW Wind
- 218 MW Small Hydro
- 120 MW Geothermal
- 28 MW Biogas



LADWP GHG (CO2) Reductions Exceed State Mandates

100% Renewable Energy Mission Statement

Develop and implement a research partnership that will utilize technical, academic, and policy experts, as well as experts from the utility industry, to study what investments should be made to achieve a 100% Renewable Energy portfolio for the Los Angeles Department of Water and Power.

Barren Ridge Switching Station

Pine Tree Wind Farm

STUDY CONSIDERATIONS

- Maintaining system reliability
- Types/availability of clean energy resources
- Role of energy storage, energy efficiency, demand response, and Energy Imbalance Market (EIM)
- Developing technologies
- Necessary infrastructure upgrades
  - Critical transmission investments
  - Role of LADWP's existing natural gas generating units
  - Once Thru Cooling (OTC) Study
- Optimization of costs
- Impact to local economy
- Impact to rate payers

CURRENT TECHNOLOGIES AND PROGRAMS

- Energy efficiency
- Clean electricity generation
  - (geothermal, hydro, solar PV, wind)
- Energy storage
  - (batteries, pumped storage, CAES)
- Transmission
- Electric vehicles
- Demand response

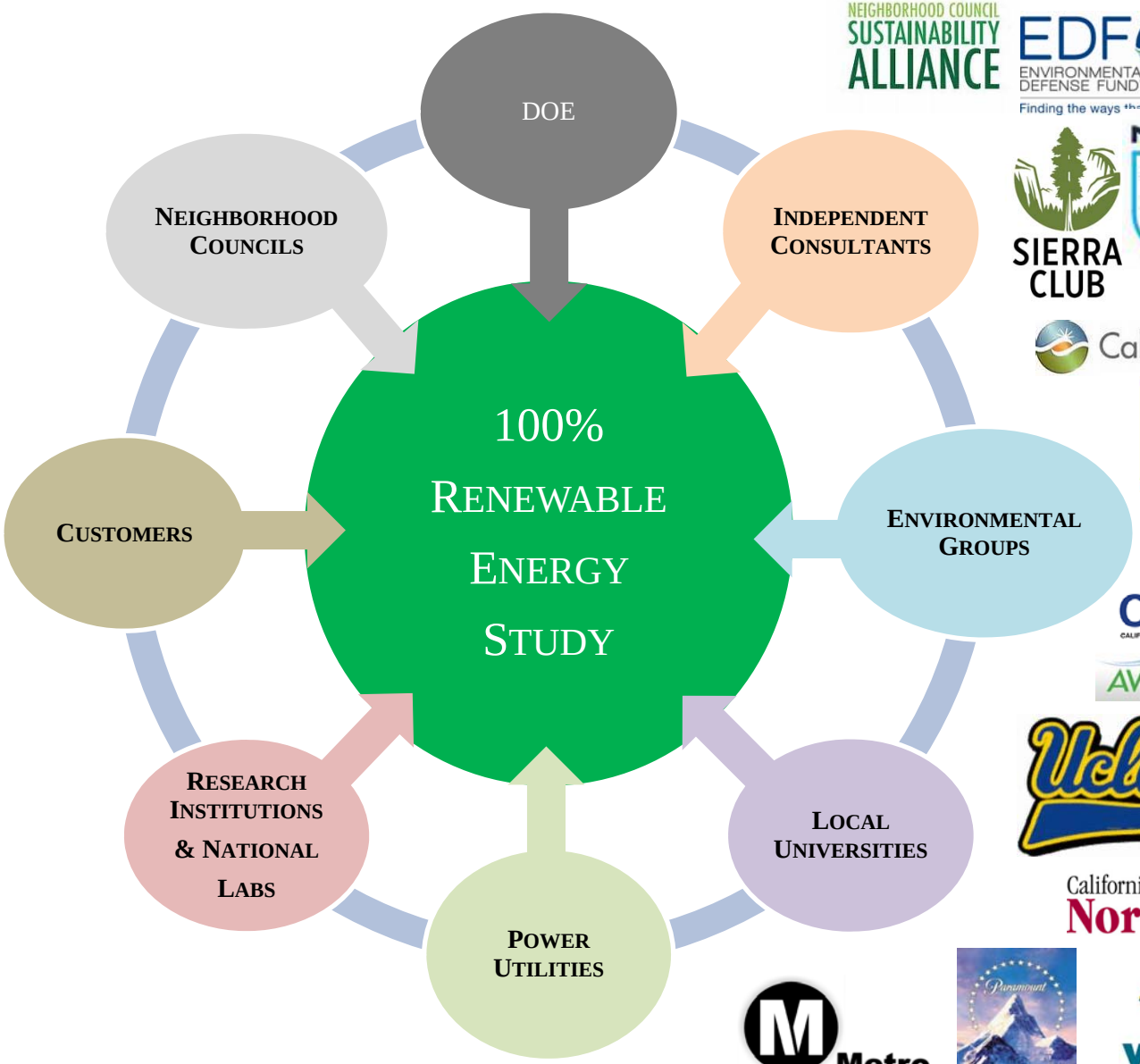
Clean Energy Building Blocks

100% Renewable Advisory Group

The 100% Renewable Advisory Group will provide necessary leadership and strategic guidance to working teams. The Advisory Group will be comprised of two individuals from each represented organization, one primary member and one alternate member. The Advisory Group will meet at least quarterly.

For purposes of continuity throughout the process, and to ensure a successful study outcome, regular and consistent participation by selected members is highly encouraged and necessary.

ADVISORY GROUP PARTICIPANTS



WORKING TEAMS

Within this Advisory Group, working teams will be formed that will consist of Advisory Group members. Each team will have regularly scheduled meetings to share information and to provide input and recommendations throughout the process.

Technical Working Team

Identify and provide input on potential data sets and models, Western regional renewable resources, and grid considerations.

Policy Working Team

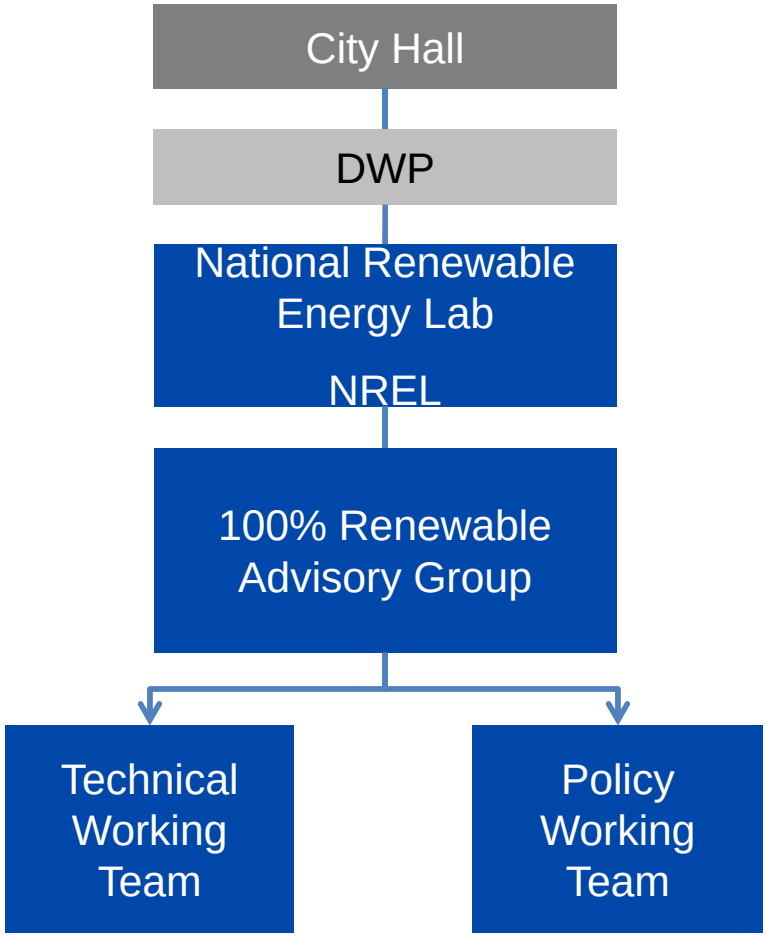
Provide input throughout the study on policy topics that represent your organizations' diverse expertise and perspectives, taking into consideration the potential local economic development benefits and environmental justice impacts.

RESEARCH PARTNERSHIPS

Examine the potential for high quality careers and equitable local economic development, including local hiring programs for work that must be performed to modernize the electric system infrastructure within the City to increase efficiency, install energy storage, add distribution-connected renewable generation and otherwise enhance the electrical grid within Los Angeles.

- Macroeconomic impacts:
  - Near-term stimulus associated with the new infrastructure construction and labor.
  - What is the impact on the Los Angeles economy as a whole?
- Environmental justice impacts: what are the impacts on local air quality, and how does that impact local communities?

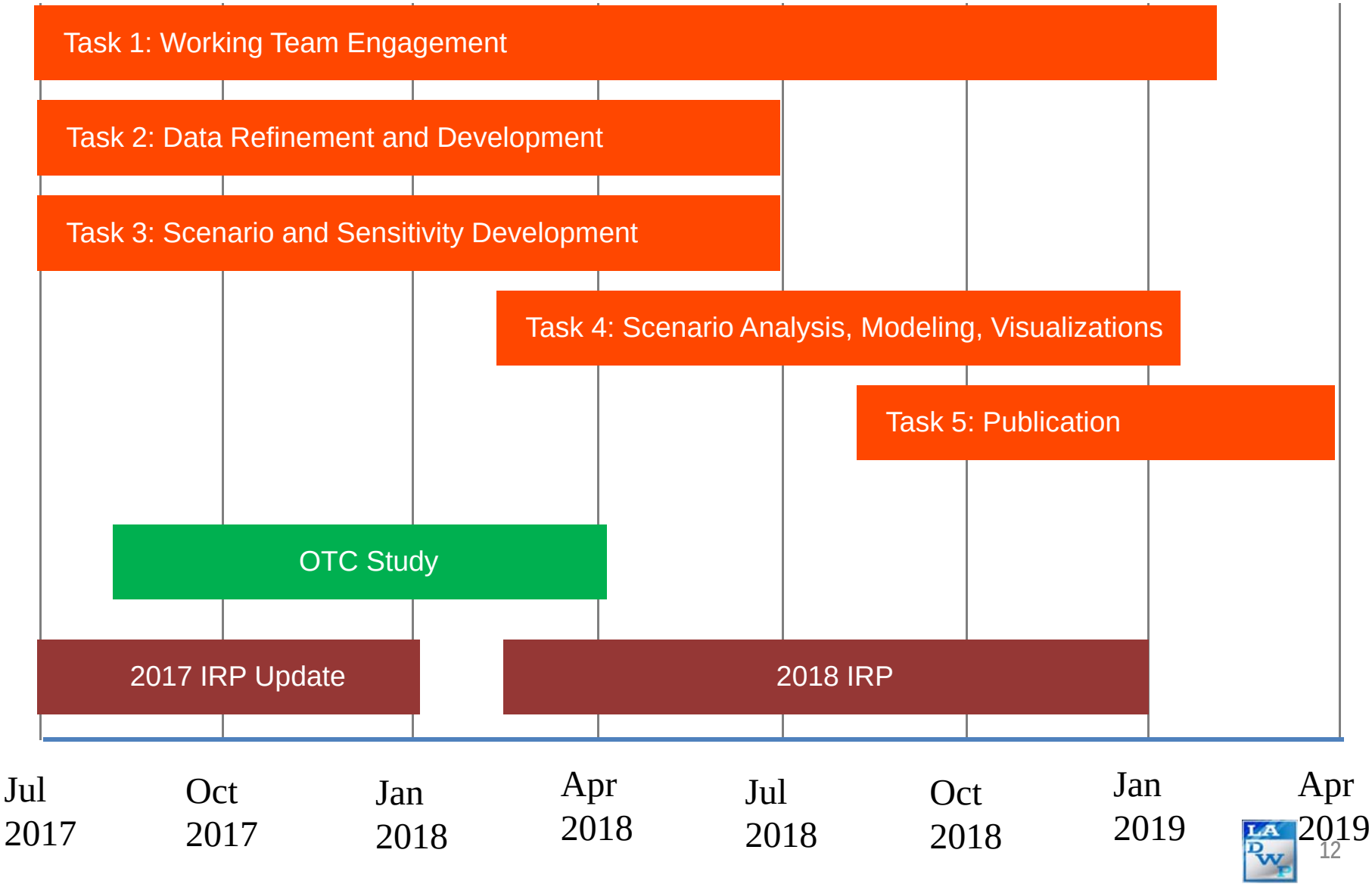
Study Organization Overview




Barren Ridge Renewable Transmission Project

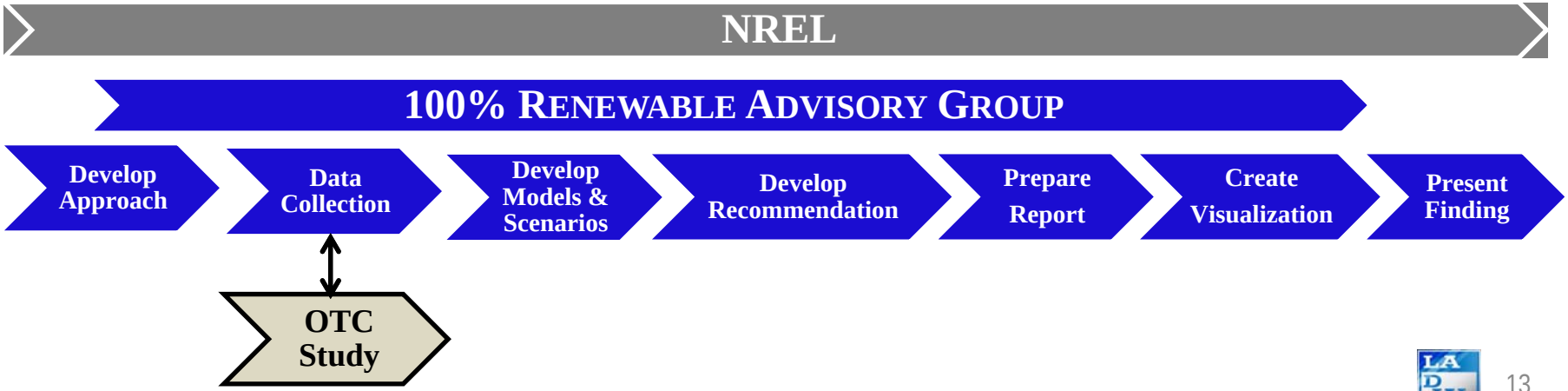

Haskell Canyon Switching Station

STUDY MILESTONES



STUDY STEPS

- Develop Approach
- Data Collection
- Develop Models & Scenarios
- Develop Recommendation
- Prepare Report
- Create Visualization
- Present Finding



Next Steps

- LADWP will work with NREL to develop roles and responsibilities
- 100% Renewable Advisory Group Meeting –July 28, 2017, LADWP/JFB (Tentative)
  - Present and discuss Advisory Group roles and responsibilities
  - Advisory Group feedback on proposed Study process
- Continue Major Milestones Development
- Assemble world-class technical study team
  - Department of Energy, National Laboratories, NREL
  - Research institutions, Universities
  - Private sector, energy experts, consultants
- Develop public outreach program

Questions?