



Creating a Path for Greater Renewables

Board of Water & Power Commissioners Meeting
June 26, 2018

Vision

Accelerate decarbonization of our Resource Mix

Provide access for increased renewable resources

Increase Renewable targets by 5% starting in 2025, resulting in 70% renewable by 2036

Downsize the contracted **1,200 MW** natural gas plant to **840 MW**

Increase efficiency and conservation programs with a focus on equity

Increase Shared Solar options for renters and occupants of multi-family housing

Explore new technologies

Reduce ratepayer costs

Increase Renewables Targets

		2017 SLTRP	Proposed
2025	Total	4,019 MW	4,575 MW
	RPS %	50%	55%
2030	Total	4,604 MW	5,108 MW
	RPS %	55%	60%
2036	Total	5,704 MW	6,208 MW
	RPS %	65%	70%

New targets included in next IRP if reduced repowering approved

LADWP Renewable Resources

Renewable Projects	2015 Capacity (MW)	2018 Capacity (MW)
Solar	290 MW	1,352 MW
Wind	996 MW	996 MW
Small Hydro & Geothermal	287 MW	375 MW
TOTAL	1,573 MW	2,723 MW <i>(73% increase)</i>

LADWP Renewable Resources in 2018 - Solar

Springbok 1&2	260 MW
Beacon Solar	250 MW
Moapa Solar	250 MW
Copper Mountain	210 MW
RE Cinco Solar	60 MW
Adelanto Solar	10 MW
Pine Tree Solar	9 MW
Local Solar	303 MW
TOTAL	1,352 MW



LADWP Renewable Resources in 2018 - Wind

Milford 1&2	287 MW
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Windy Point	262 MW
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Pine Tree Wind	135 MW
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PPM Wyoming	82 MW
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Willow Creek	72 MW
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Pebble Springs	69 MW
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Linden Wind	50 MW
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Manzana Wind	39 MW
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TOTAL	996 MW
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LADWP Renewable Resources in 2018 - Geothermal & Small Hydro

Geothermal

Hudson Ranch	55 MW
NV Geothermal	36 MW
Heber 1	36 MW
Don Campbell 1&2	30 MW
Ormesa Geothermal	10 MW
TOTAL Geothermal	167 MW
Total Small Hydro	208 MW
TOTAL	375 MW

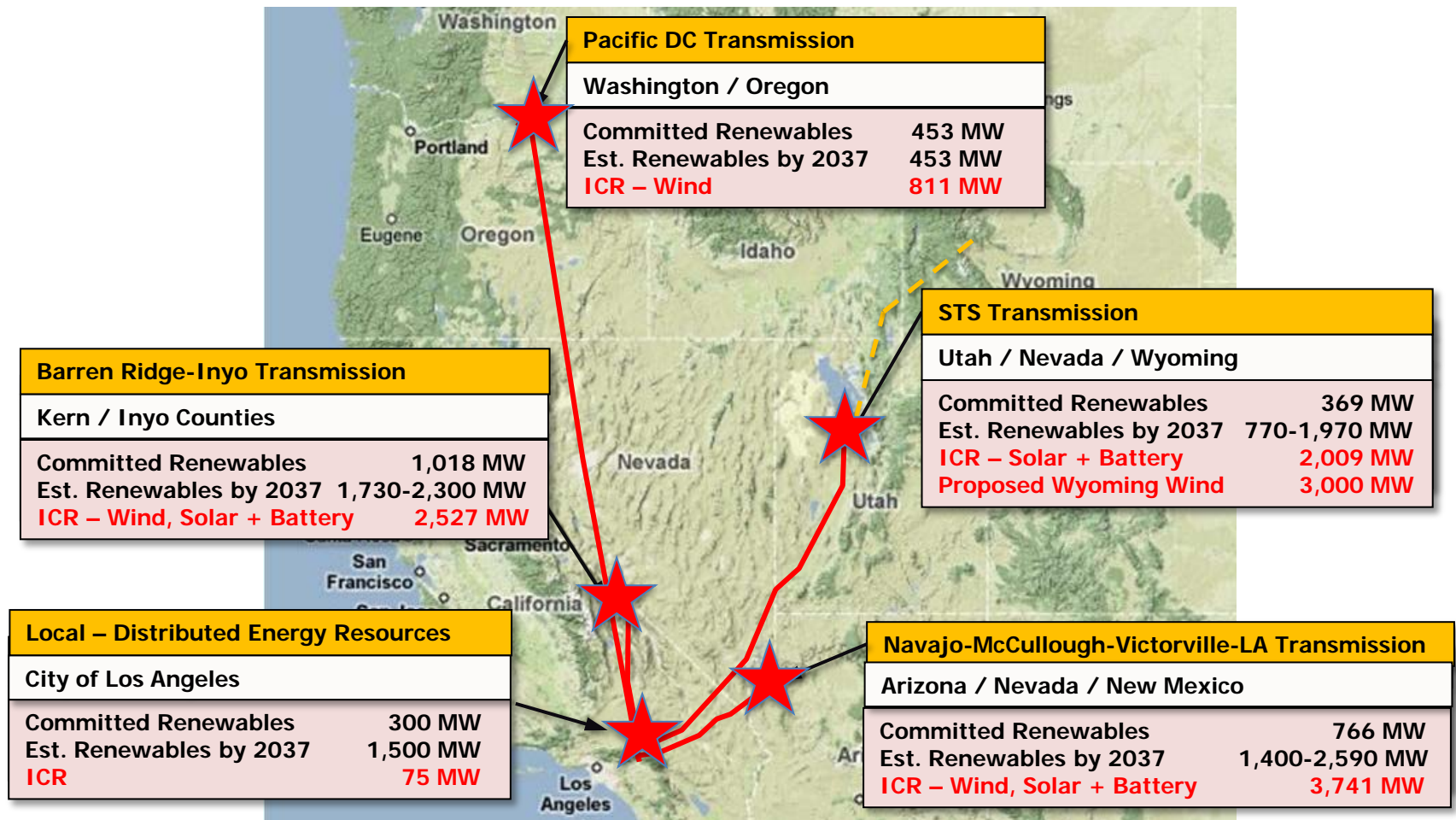


Two Main Transmission Lines



Renewable Interconnection Requests

2017-2037: 12,163 MW



Reduced Repowering

- Reduce the contractually committed Intermountain Power Project natural gas Repowering Project by 30%
- Downsize the fossil fuel portion of this resource from 1200 MW to 840 MW to allow for a faster integration and higher proportion of renewable resources

Definitions

IPA – Intermountain Power Agency

Utah Interlocal Cooperation that owns all Project assets

IPP – Intermountain Power Project

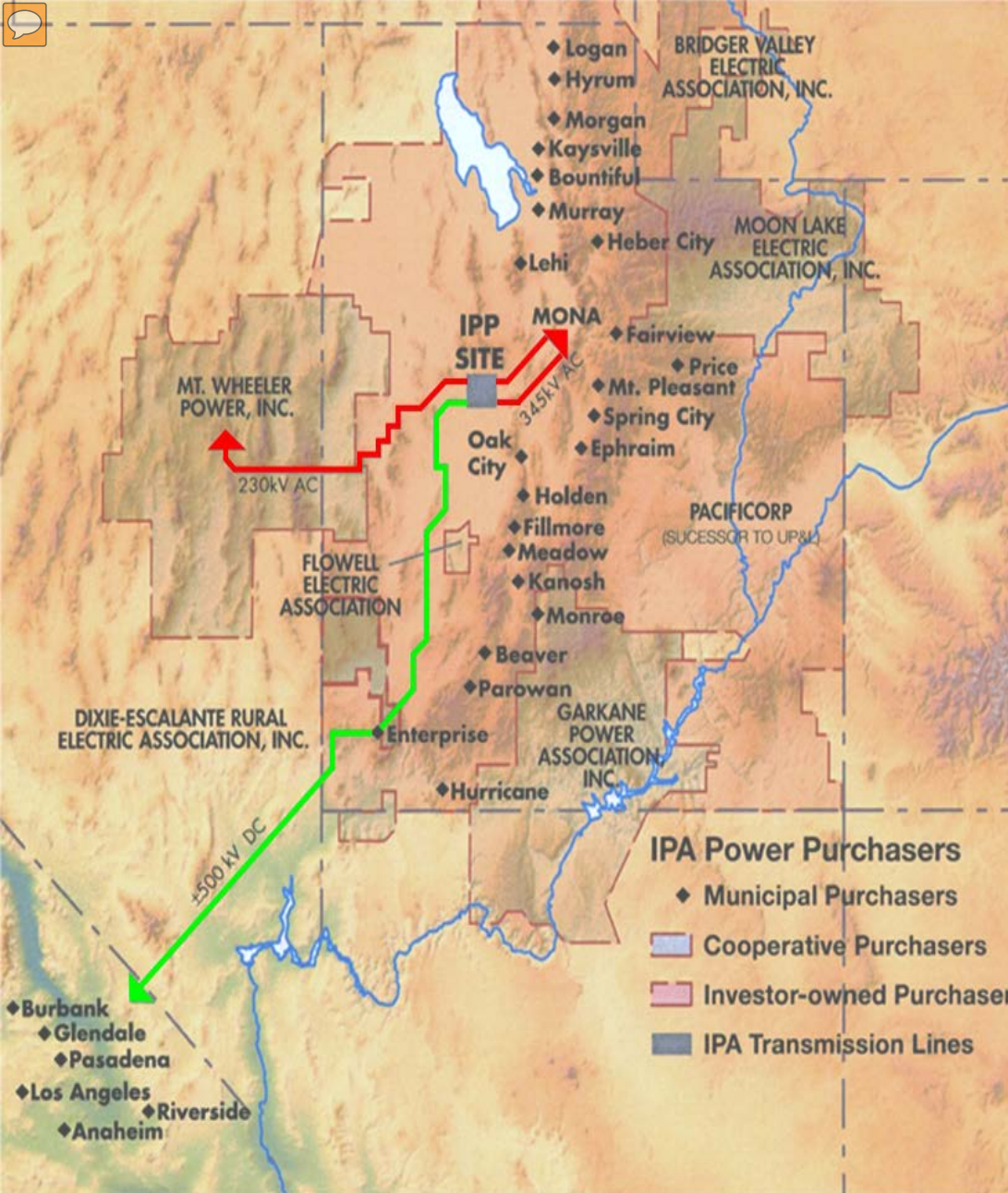
“Bundled” existing and future generation and transmission assets, and all ancillary facilities

IPSC – Intermountain Power Service Corporation

Responsible for work related to the IPP Utah facility with Utah employees under the Operating Agent’s guidance

Construction Management / Operating Agent

LADWP’s roles and responsibilities delegated through contractual obligation with IPA related to the construction, operation and maintenance of the Project



IPP Contract 1981-2027

“Bundled” Project

Operating since 1986

IPP Location: Delta, Utah

1800 MW Total Capacity

Two – 900 MW Units

Northern and Southern
Transmission Systems

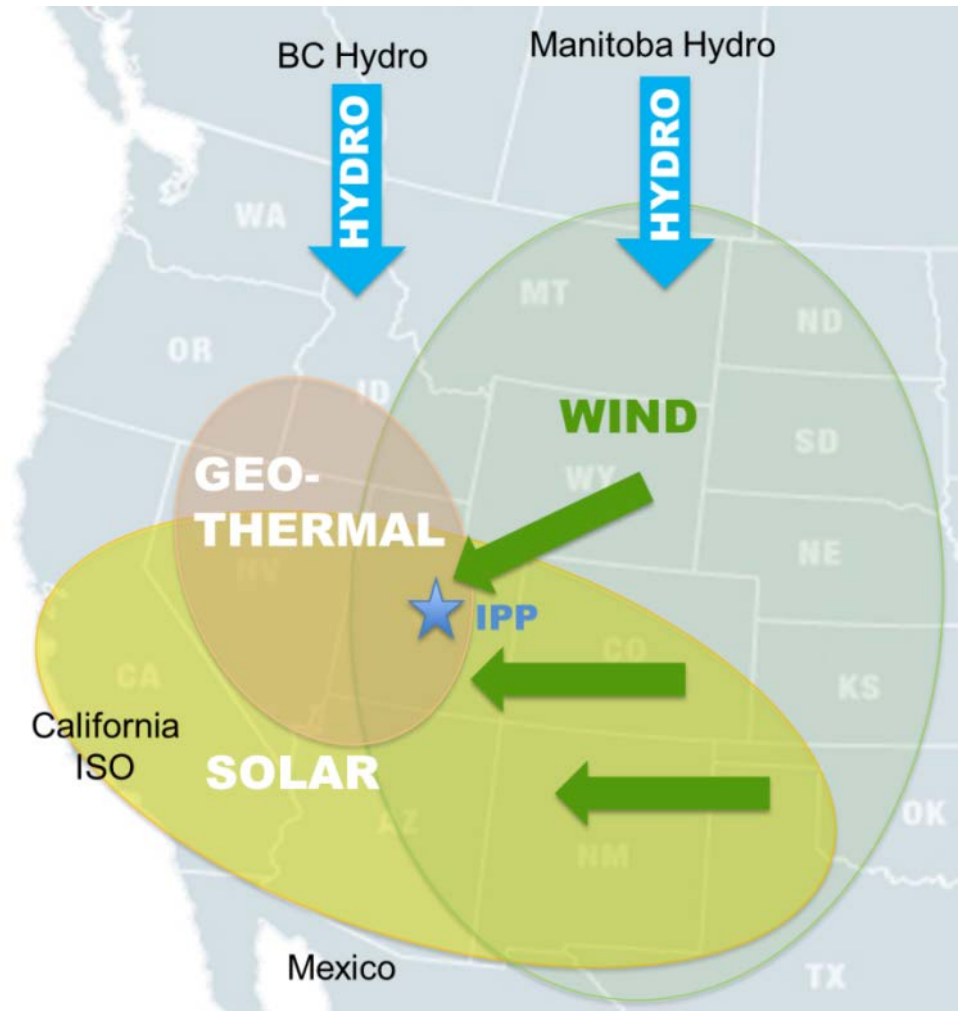
Land and Water Rights

**All assets revert back to
IPA at end of contract

Who are the 35 IPP Participants Today?

UTAH MUNICIPAL PARTICIPANTS:		UTAH / NEVADA COOP PARTICIPANTS:	CALIFORNIA PARTICIPANTS:
Beaver	Lehi	Bridger Valley REA	Anaheim
Bountiful	Logan	Dixie-Escalante REA	Burbank
Enterprise	Meadow	Flowell Electric Assoc.	Glendale
Ephraim	Monroe	Garkane Power Assoc.	LADWP
Fairview	Morgan	Moon Lake Elec. Assoc.	Pasadena
Fillmore	Mt. Pleasant	Mt. Wheeler Power, Inc.	Riverside
Heber	Murray		
Holden	Oak City		
Hurricane	Parowan		
Hyrum	Price		
Kanosh	Spring City		
Kaysville			

IPP Location is a Renewable Hub



Repowering Efforts for 2015 Contract

2008: Working to extend Power Sales Contracts Beyond 2027



2009: IPP Strategic Plan Develop. Comm. – Coal to Gas, NGCC, Peakers, Renewables, Nuclear



2011: Consensus on Generation. Begin developing contracts for 2027 to 2077 term



2012: Consensus: 1200 MW Project. Renewal Power Sales Contract expected in 2013



2013: Second Amendatory Power Sales Contract approved by Utah, LADWP, and APU



2014: Reset of negotiations. California Participants working through issues



2016: Renewal Power Sales Contract approved by all CA Participants – 1200 MW



2013 Board and Council Approval
IPP - Convert 1,800 MW Coal to 1,200 MW Gas

City Council Meeting, April 23, 2013

"...as we back down and get out of the IPP coal project altogether...**much smaller gas fired plant there ... opportunities to expand upon 300 MW of wind ...to put even more renewables ...diverse renewable portfolio. "**

– Ron Nichols, LADWP General Manager



2015 IPP Repower Project

Unanimously approved by Board, E&E, and City Council

Board - June 2, 2015

Energy & Environment Committee – August 5, 2015

City Council – August 18, 2015

All IPP Participants Approved

Binding Contracts effective January 2017

New contracts extend project from 2027 to 2077

Repower Project

1,200 MW Natural Gas (two 600 MW units)

Begin construction – January 1, 2020

Operational - July 1, 2025

Supportive public comments received at public meetings

Participant Entitlements – Post 2027

	Generation %	STS %
PURCHASERS		
Los Angeles Department of Water and Power	64.775%	82.0528%
Burbank Water and Power	4.167%	5.2785%
Glendale Water and Power	4.167%	5.2785%
Riverside Public Utilities	4.167%	5.2785%
Pasadena Water and Power	1.667%	2.1117%
CALIFORNIA GROUP TOTAL	78.943%	100%
UTAH COOPERATIVE GROUP TOTAL	7.082%	0%
UTAH MUNICIPAL GROUP TOTAL	13.975%	0%
TOTALS	100%	100%

Public Outreach Process

Describing IPP Repowering from Coal to 1200 MW Natural Gas

2011 IRP

4/5/15 E&E Comm.

2012 IRP

4/18/15 City Council

2012 IRP Public Outreach

2014 LADWP Briefing Book

2013 IRP Public Outreach

2015-2016 LADWP Briefing Book

3/19/13 LADWP Board

2017-2018 LADWP Briefing Book

4/17/13 E&E Comm.

2016 IRP

4/23/13 City Council

9/20/16 LADWP Board

2013 Press release

10/19/16 CEC SB 1368 Filing Approval

2014 IRP

2017 Power SLTRP /IRP

2014 IRP Public Outreach

10/17/17 LADWP Board

4/23/15 LADWP Board

6/2/15 LADWP Board



IPP Reduction

January 2017 - Binding 1200 MW contract – required 8 years to obtain unanimous approval of 35 participants and their governing bodies

August 2017 - LADWP GM/SAGM - leveraged historical relationships to confidentially request IPA Board to consider reducing repowering “Alternative Project”

Segmentation provides future flexibility

LADWP Board Meeting, October 17, 2017

“We’re currently looking at repowering IPP. Based on research, though tentative, it looks like we can reduce natural gas repowering by about 25%”

– General Manager David Wright

Participant Entitlements – Post 2027

	Generation %	STS %	Generation MW	STS MW
PURCHASERS				
Los Angeles Department of Water and Power	64.775%	82.0528%	544	1969.0
Burbank Water and Power	4.167%	5.2785%	35	127.0
Glendale Water and Power	4.167%	5.2785%	35	127.0
Riverside Public Utilities	4.167%	5.2785%	35	127.0
Pasadena Water and Power	1.667%	2.1117%	15	50.0
CALIFORNIA GROUP TOTAL	78.943%	100%	663	2400
UTAH COOPERATIVE GROUP TOTAL	7.082%	0%	60	
UTAH MUNIPICAL GROUP TOTAL	13.975%	0%	117	
TOTALS	100%	100%	840	

Why 840 MW?

Engineering study (3/2018):

800 to 900 MW minimum
generation

Maintains reliable operation of
the STS

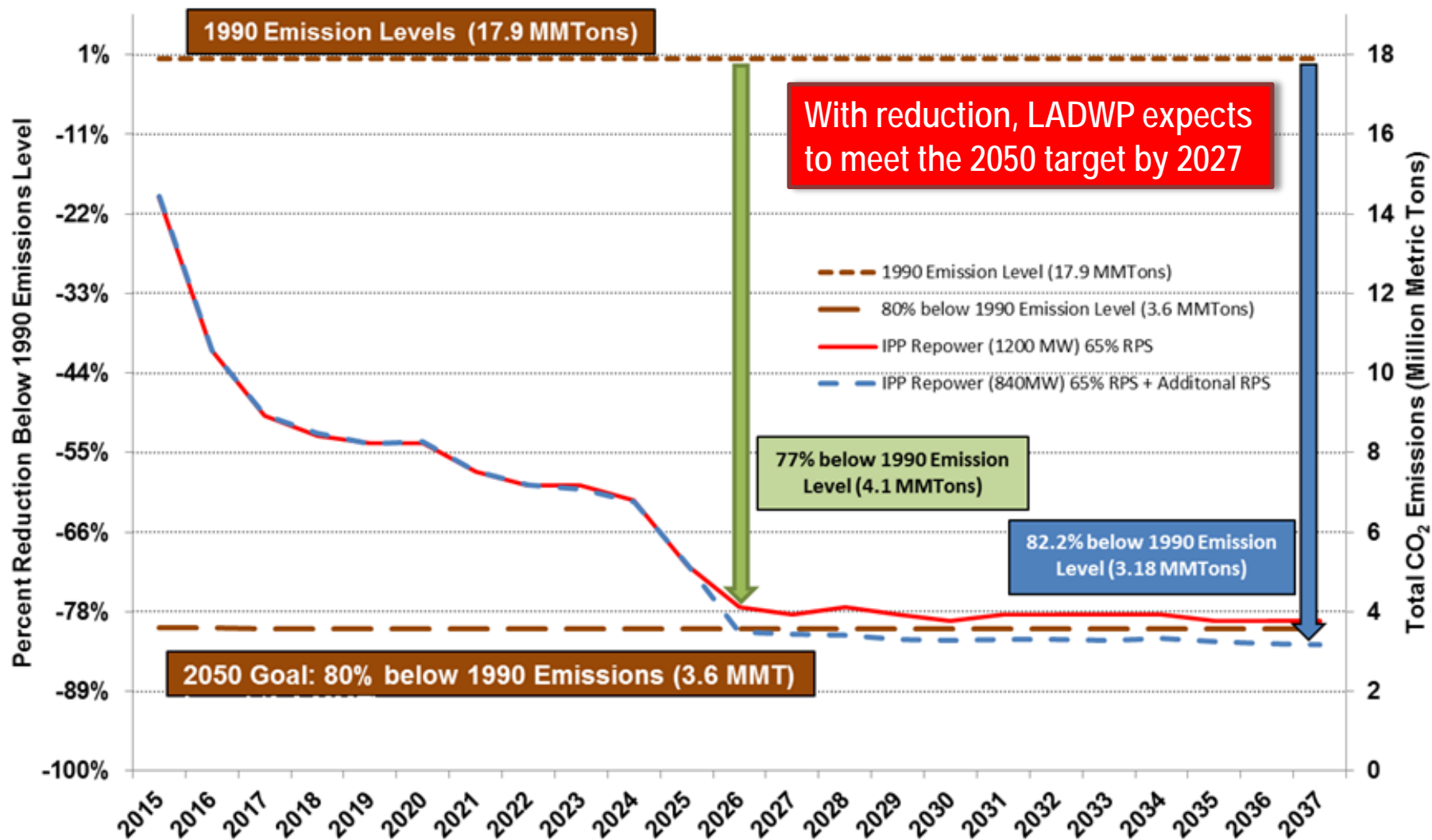
Not baseload for LADWP

840 MW - all 35 Participants
agree this meets individual
requirements

Saves approximately \$360 to
\$400 Million



GHG Emissions Forecast



Achieving Reduced Repowering

August 7, 2018 - Vote to approve reduction to 840 MW
scheduled at the IPA Board Meeting

All participants and IPA Board must approve

California and some Utah participants waiting on LADWP to
approve

Veto of reduction still possible by others

LADWP cannot unilaterally control Project destiny

Generation Profile of Two 420 MW Units

Smaller units

Advanced Class

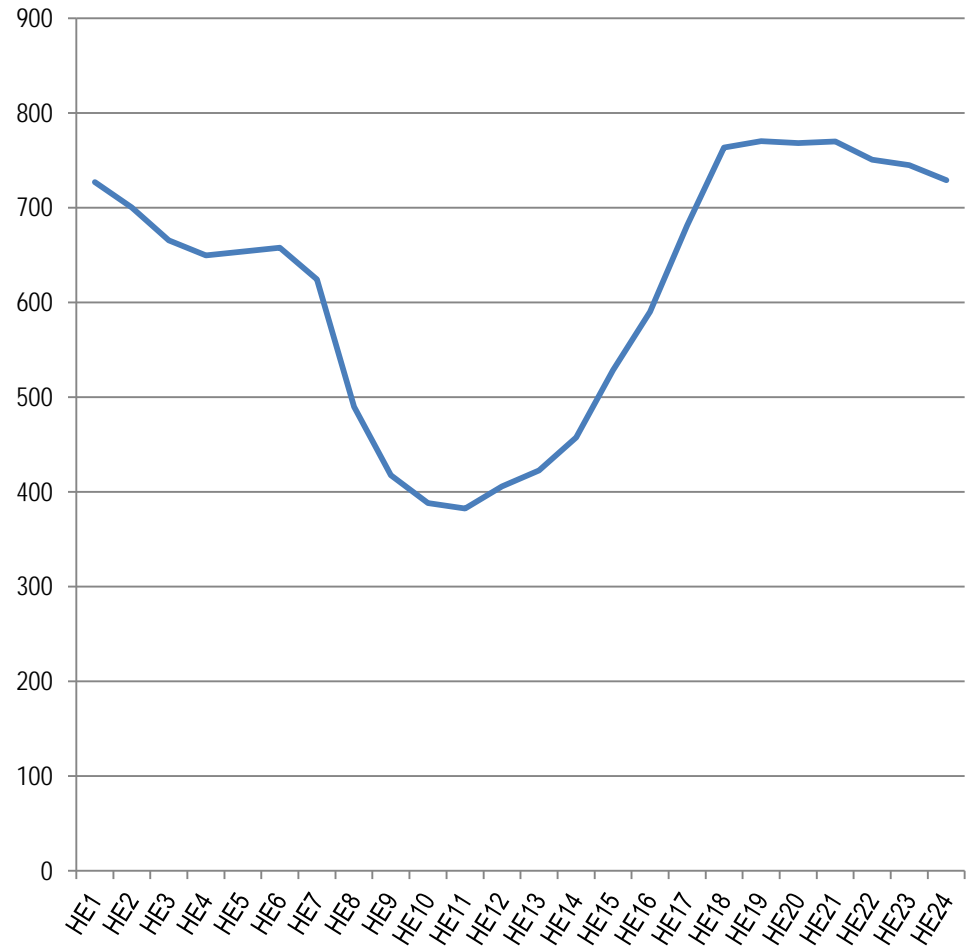
Natural-Gas Combined
Cycle Units

Designed to integrate
renewables

More flexibility

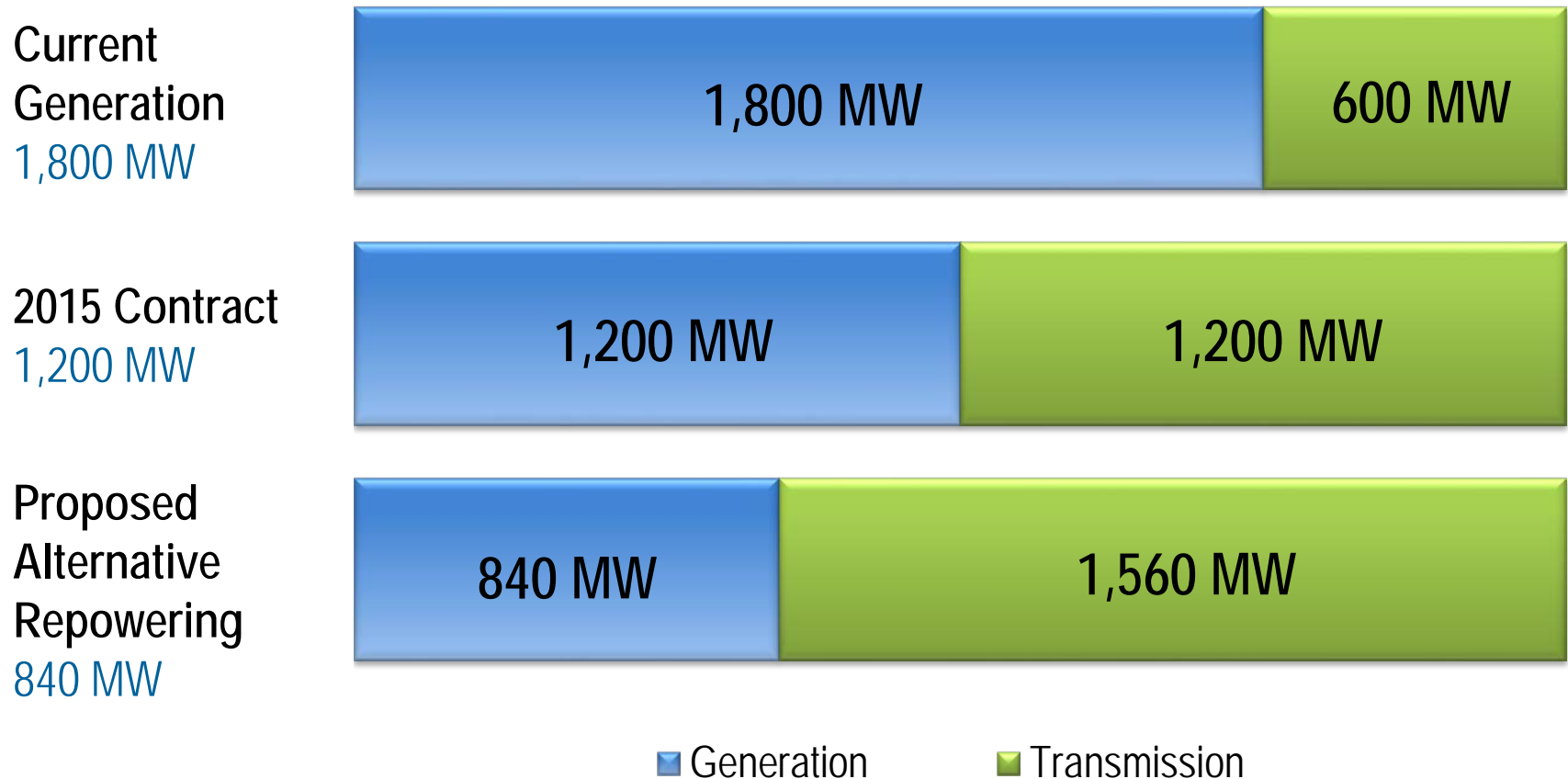
Improved efficiency

Better emissions profile



Average Forecasted Daily Generation Profile

Reduction – Adds 360 MW of Transmission for Renewables



Project Timeline Moving Forward

CEC SB 1368 Compliance Filing for 1,200 MW

CEC SB 1368 Compliance Filing for 840 MW

Alternate Repowering Process

OEM Specification Development & Award

Land & Water Permitting for Generating Facility

Air Modeling for Generating Facility

Air Permitting for Generating Facility

Contractually Required Start of Construction

EPC Specification Development & Award

FUTURE:

Construction & Commissioning

In Service Date

No Action Required

September 2018

August 2017 – August 2018

June 2018 – January 2019

August 2018 – December 2019

January 2019 – September 2019

January 2019 – September 2020

January 2020

July 2019 – February 2022

February 2022 – July 2025

July 2025

Recommended Project Financing Goal

Financing of Generation

Unit 1 paid off year 5/6

Unit 2 paid off year 10/12

Financing of Transmission – remainder of debt period

Flexibility for future generation technologies

Potential to utilize hydrogen as future fuel source

No rate impacts from stranded generation assets

LADWP's share of generating assets not used to solely sell power nor sold to another utility – LA controls its generation share

Sample amortization of debt service:

Unit 1	Unit 2	Transmission
Thirty Year Bonds - Project Financing		

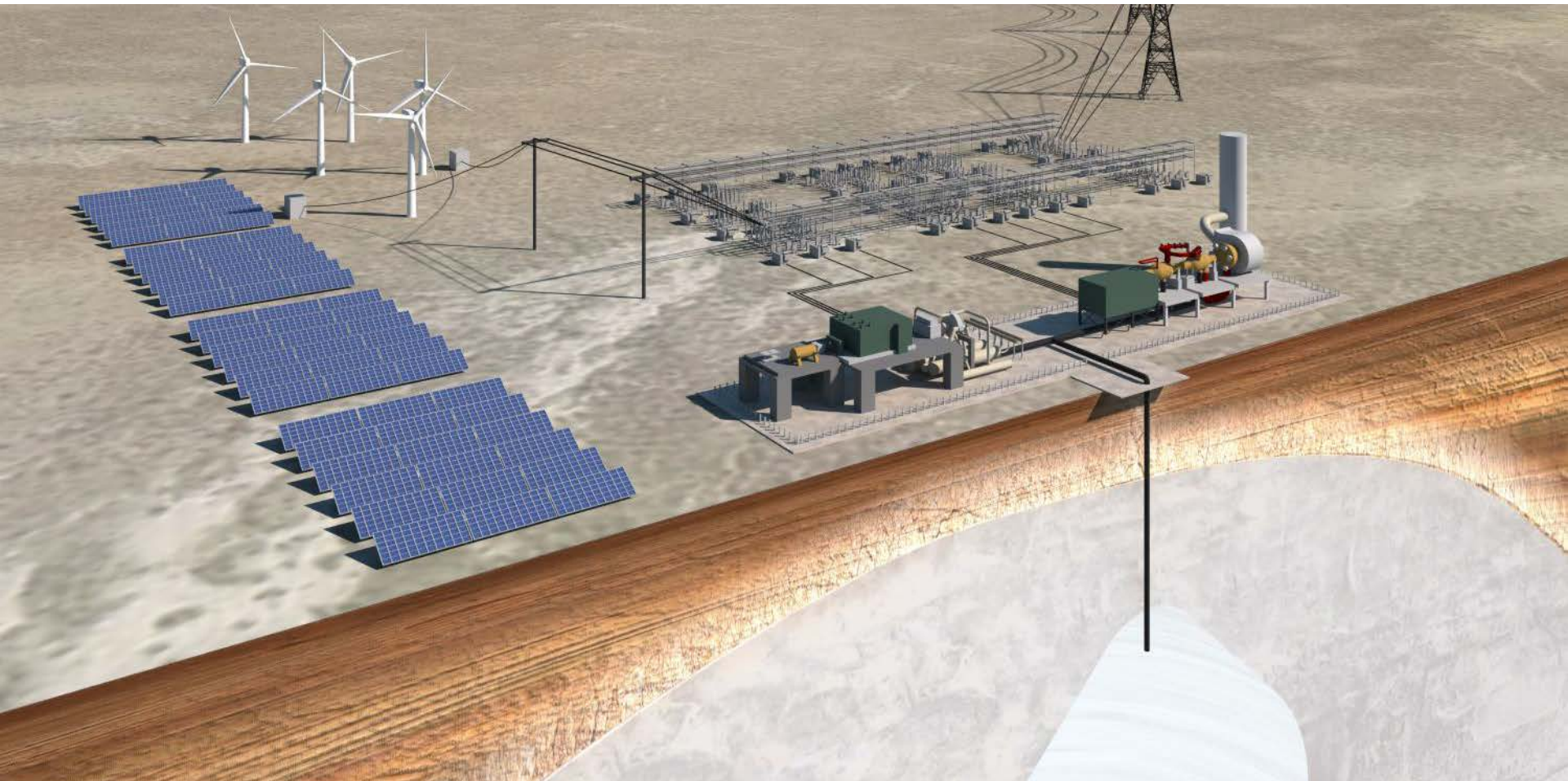
Additional Renewables & Storage

		Planned 1200 MW		Planned 840 MW	
		STS*	Total	STS*	Total
2025	Wind	287	944	500	1200
	Solar	200	2503	543	2803
	Energy Storage**	260	585	410	735
	Geothermal	0	355	0	355
	Small Hydro		217		217
	Total		4019		4575
	RPS %		50%		55%
2030	Wind	387	1175	591	1379
	Solar	200	2797	500	3097
	Energy Storage**	260	585	410	735
	Geothermal	0	415	0	415
	Small Hydro		217		217
	Total		4604		5108
	RPS %		55%		60%
2036	Wind	487	1465	691	1669
	Solar	200	3537	500	3837
	Energy Storage**	260	860	410	1160
	Geothermal	35	485	35	485
	Small Hydro		217		217
	Total		5704		6208
	RPS %		65%		70%

* - Denotes the STS component which has been incorporated into the Total

** - Includes Battery Storage (4 hour) and 160 MW CAES (8000+ MWh capacity)

Potential at Site – Compressed Air Energy Storage



Compressed Air Energy Storage Project

Ideal site

Pilot Project: 160 MW

Potential for multiple CAES Units at site

RFP issued through SCPPA

Potential joint CAES project with several other
IPP Participants

LADWP's 2018 Strategic Resource Planning

2018 Strategic Long-Term Resource Plan (IRP)

360 MW
Additional
Renewable
IPP 840 MW
Gas Plant

(Reduced from 1,200 MW)

Long Term
Transmission
Assessment

Once-Thru-
Cooling Study

100%
Renewable
Energy Study

Energy Efficiency & Conservation

Energy demand reduction is
key IRP component

Additional \$100 Million
budgeted over 5 years

Initially target low income
renters in multifamily housing
Hard to reach customer segment
Improves equity





Energy Efficiency & Conservation



Insulation, Appliance Rebates, Light Bulbs

Insulation rebates offer significant potential

Construction before 1978 prioritized Greatest energy savings and GHG reductions

Demand reduction helps all rate payers

Potential UPCT increased opportunities for local jobs

Increased Solar

\$10 Million increase in budget
for Shared Solar

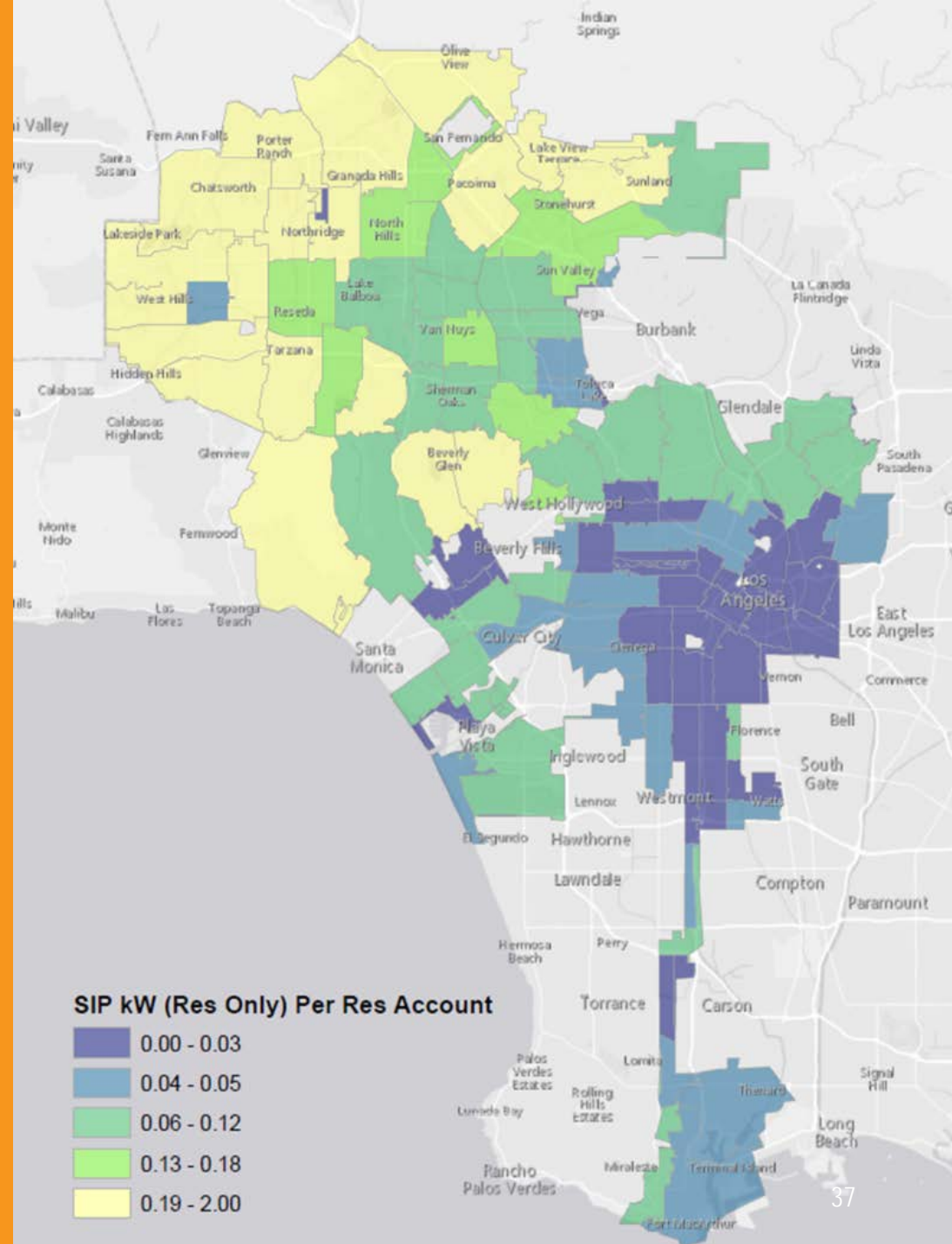
Initial pilot phase to start late
Fall 2018

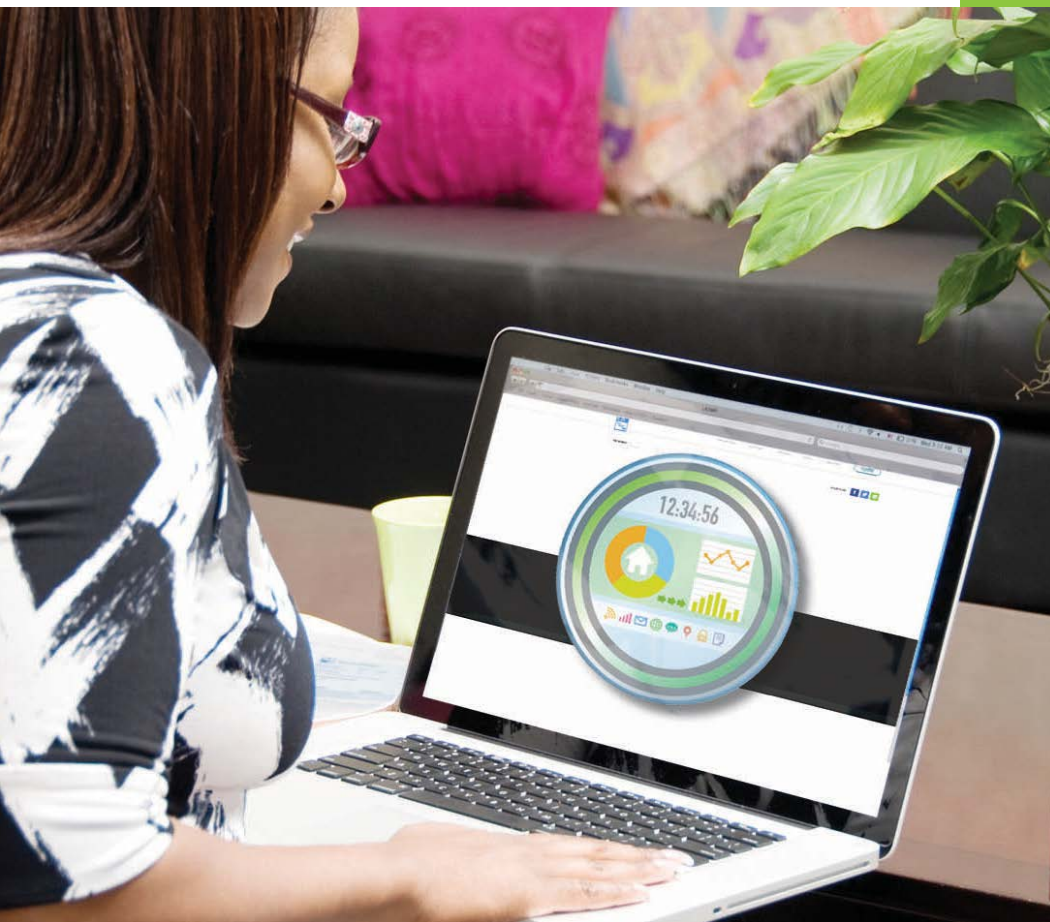
Target areas with low solar
penetration

Clean Up Green Up areas
prioritized -i.e., Pacoima, Boyle
Heights, Wilmington, Watts, etc.



Metrics: Geographic Solar Diversity





Virtual Net Metering

Billing system challenge
Pilot program to start in
2019



Significant Additional Items



100% Renewable Study ongoing
– 2020

One Through Cooling Study
completion 2018

Will not negatively change
assumptions for the 100%
Renewables or OTC Studies

In fact, IPP reduces usage of
in-basin gas

Without Project, LADWP's RPS
Goals cannot be met

Joint project allows potential
opportunities with other
in-basin utilities

Comprehensive Recommendation

It is requested that the Board of Water and Power Commissioners:

1. Support that the increased RPS goals of 55% by 2025, 60% by 2030, and 70% by 2036 will be included as a new resource scenario to be evaluated in the 2018 Power SLTRP list of proposed scenarios, presented for public outreach and comments, and given serious consideration by management, considering public feedback, as a 2018 SLTRP recommended case;
2. Adopt the attached Resolution authorizing LADWP to participate in a future vote on the Alternative Repowering
3. Support budgeting beginning fiscal year 2019/20, of an additional \$100 million over five years in Energy Efficiency programs primarily focused on low income customers in multi-family housing;
4. Support budgeting beginning in fiscal year 2019/20, of an additional \$10 million towards the Shared Solar Program, which will be starting in fiscal year 2018/19
5. Support budgeting beginning fiscal year 2019/20 for a pilot Virtual Net Metering program starting in 2019; and
6. Request that staff report back to the Board within 90 days on the status of the proposed Compressed Air Energy Storage project at the IPP site.



CUSTOMERS FIRST