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SB 100 Joint Agency Report

Modeling Inputs and Assumptions Workshop

Imperial Irrigation District Comments



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IID Electrical Service Area

About IID

- Balancing Authority
- 156,000 electric accounts
- Adopted an Open Access Transmission Tariff in 2001
- 1,100 MW of renewable interconnected resources consisting of small hydro, geothermal, biomass and solar.
- Home to the Salton Sea Known Geothermal Resource Area

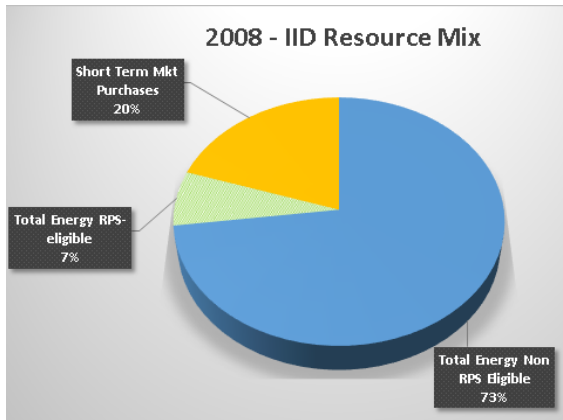
Demographics

- IID's customer classes:
 - *Residential (86%)*
 - *Commercial (13.5%)*
 - *Industrial (.5%)*
- Unemployment:
 - *20.7% as of September 2019*
- Number of customers receiving rate assistance (monthly):
 - *10,868 or approximately 15%*

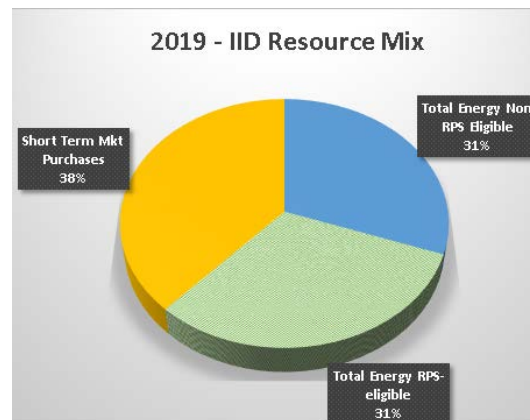


IID Resource Mix

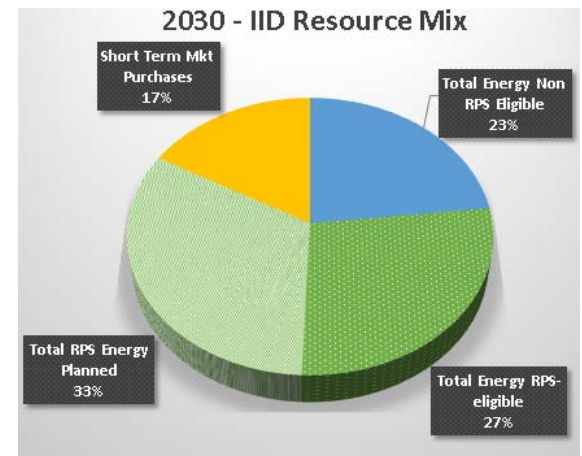
- IID is RPS compliant and is committed to meeting future RPS requirements



where we were



where we are

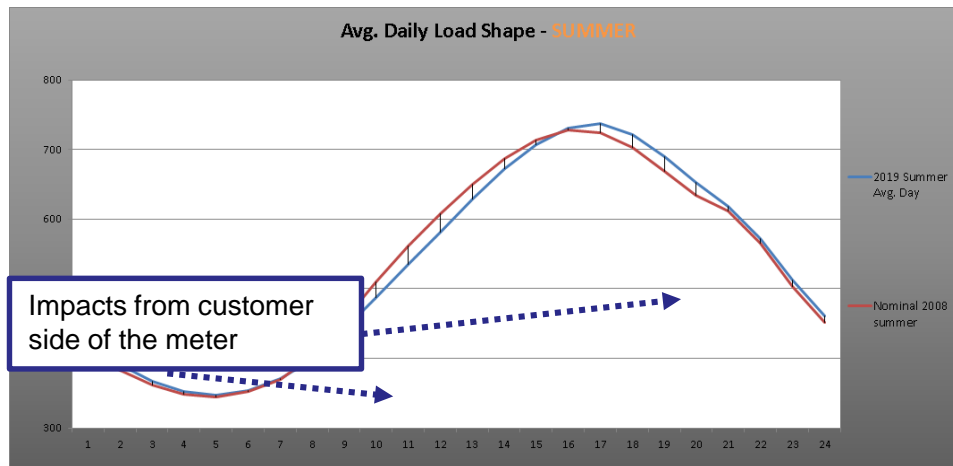
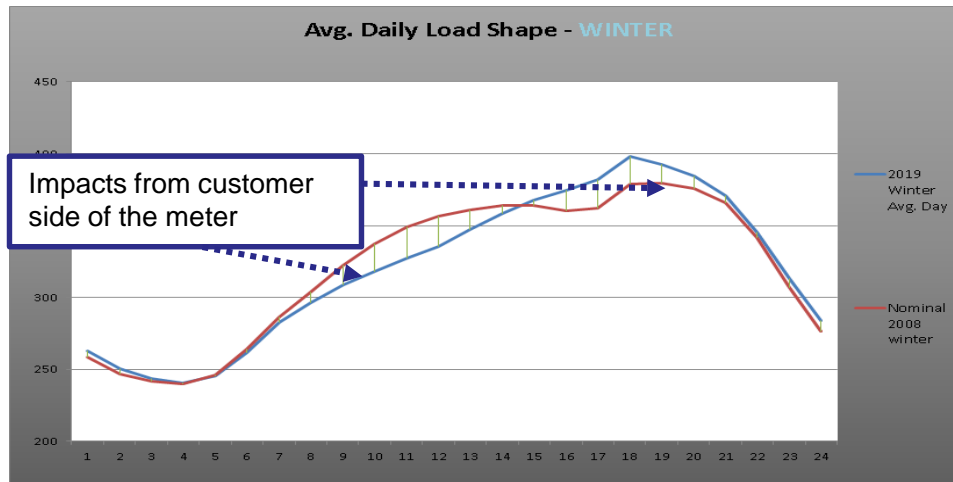


where we plan to be

SB100 Challenges for the Balancing Authority

- IID balances by matching internal generation and imports/exports to load
 - *IID Summer Peak Load:* *1067 MW*
 - *IID Winter Low Load:* *209 MW*
 - 800 MW seasonal fluctuation results in idle generation
 - Currently curtailing generation resources due to excess generation and not enough local demand

Load Profile Impact (last 12 years)



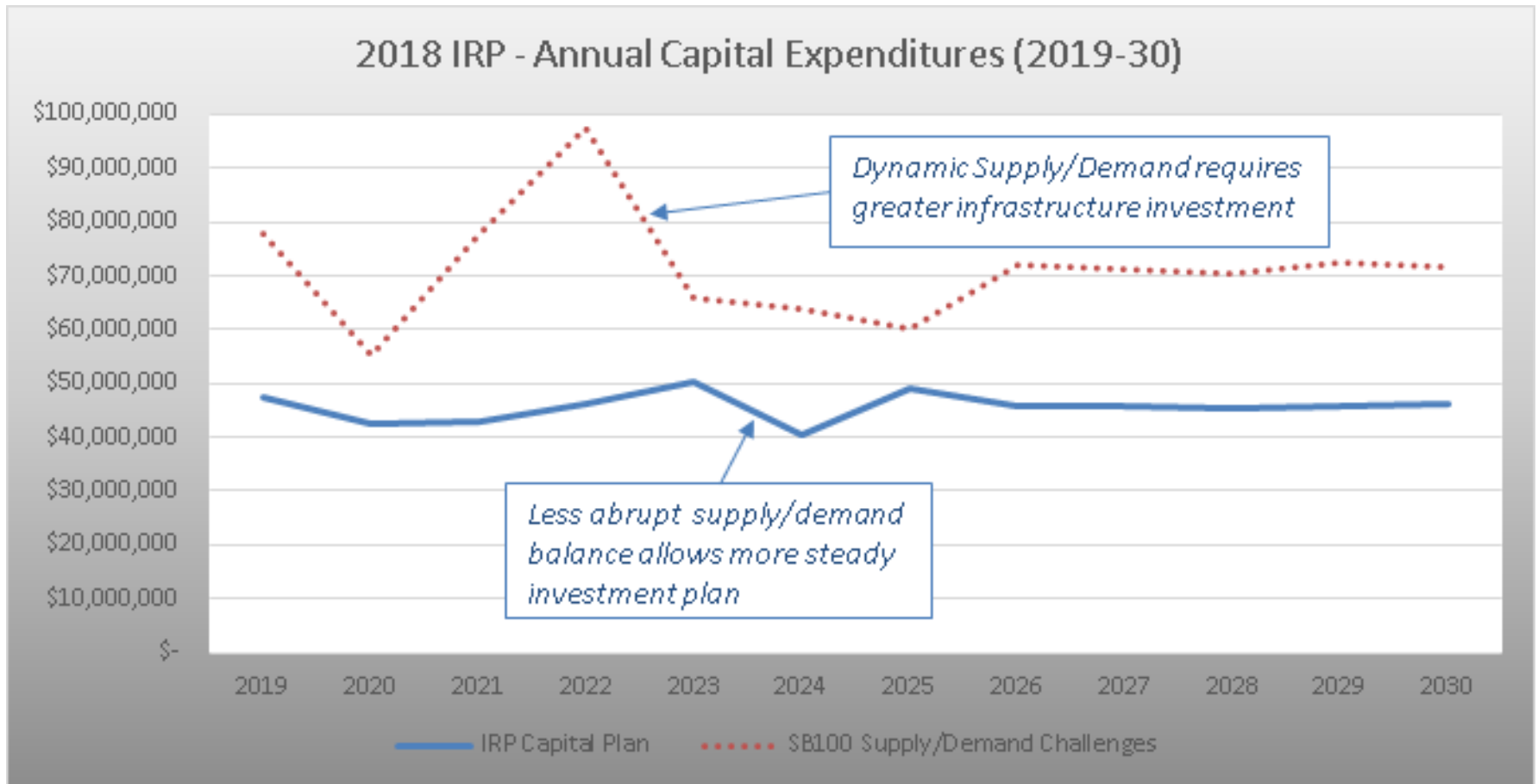
- Customer activities are non-controllable on an hourly basis
- Less load control = greater volatility in net load
- Scheduling/Trading must dispatch around this new load profile every hour of every day of the year
- IID BA must balance system each second
- Existing resources must be flexible to ramp around new and evolving load profile
- Potential New resources must contain flexibility to shift quickly during daily extreme highs and lows

Resource Shift

- Transition from thermal fleet to variable and energy limited resource mix
- The shift to resources without inertia increases reliability risks to the system
- Current lack of cost-effective technological solutions to replace gas-fired generation is a challenge
 - *Looking for areas where technology is improved and costs decreased; IID is risk averse to new, unproven technologies*
- IID evaluating participation the Energy Imbalance Market (EIM) to help mitigate the impact of over production



SB100 Capital Investment Challenges



- *Infrastructure investment depends on load growth and customer activities and the dynamic relationship between resource supply and demand.*

SB100 Cost Challenges

- Retirement of generation units before end of useful life requires covering of existing debt service obligations (stranded cost)
 - *IID's last gas unit achieved commercial operation in 2012*
- Replacement of existing units with more reactive and flexible resources will result in additional cost
- Actual cost of IRP integration is artificially masked by lower gas prices
- During the transition to 100% all costs will be pushed back to IID's 156,000 customers, causing increased rates
 - *IID's low income customers will suffer greatest negative impact*
- During transition to 100%, the retirement of fast ramping units will drive increased costs for balancing and ancillary services

SB100 Long Term Challenges

- Additional cost burden of new resources and transmission will be borne by IID ratepayers
- Time required to build new resources and transmission is a factor
- Additional costs drive the need for rate increases on customer base least able to bear the burden
 - *Imperial County is one of the poorest counties in the country*
 - *Imperial County has high unemployment rates*
- Uncertainties in resource procurement and capital investments due to potential loss of load in the Coachella Valley portion of IID's system (approximately 60% of load) by 2033

Energy Storage and IID Future Plans

- IID has invested in storage with a 20MWhr/30MVA battery
- Energy Storage has seen a dramatic decrease in cost and significant improvement in technology
- Energy Storage appears to be a helpful addition to the IID system in meeting SB100 goals except when:
 - *Extensive debt is required to acquire the technology*
 - *Other regulating units will require retirement, thus requiring heavier investment*
 - *The storage is added in an untimely manner (too soon)*
 - Early adopter issues
 - *The storage must be added with other intermittent resource creating additional need for more storage*

Future IPP Interconnections

- Interconnection requests processed under IID's Open Access Transmission Tariff adopted by IID Board in 2001, as amended
- 2,325 MW in active interconnection queue projects
 - *250 MW Solar*
 - *550 MW Geothermal*
 - *1525 MW Solar and Storage*
- Majority of queued projects intended for export from IID system
- Serially assessed for impacts and infrastructure needs

Transmission Planning Challenges

- Aging infrastructure
- Challenges stemming from being in the Desert Southwest region
 - *BESS 10MWH (cooling, losses) for a 20MW system*
 - What future technologies can avoid these issues?
 - *High ambient temperatures affecting efficiency of all resources, i.e., loss of solar efficiency at temperatures above 110°F*
- Potential for large scale infrastructure additions within the IID BA due to renewable potential within footprint (geothermal, solar/storage)
- Uncertainty in fast-ramping gas units future pushes for embedded effective energy storage systems

Transmission Planning Challenges

- Energy storage used to defer reliability upgrades
- Composite load models vs lack of system inertia
- DSW load composition impacts on system stability
- Low load/High renewable export scenarios
- Geothermal, solar production, and exports to increase from the IID area
 - *Substantial transmission system upgrades necessary to meet forecast*
 - *Assessed via multiplication of existing queue resources*
 - *Additional 1,500MW-2,500MW integration requires ~\$300M - \$500M in infrastructure + Remedial Action Schemes*
- Requesting additional scenario to assess increased geothermal out of IID's balancing authority's area



Questions?