

**INTEGRATED RESOURCE PLAN (IRP)**

Date: June 30, 2023

IRPs shall consider all reasonable opportunities to meet future energy resource requirements using Demand Side Management techniques, new renewable resources and other programs that will provide retail consumers with electricity at the lowest possible costs, and minimize, to the extent practicable, adverse environmental effects.

To meet your Integrated Resource Planning reporting requirement, complete the following. Unaddressed items will be deemed incomplete and not eligible for approval. Western reserves the right to require customers to provide any supporting back-up data used to support and develop this report.

**Customer Contact Information:**

(Provide contact information for your organization. Contact person should be able to answer questions concerning the plan)

|                        |  |
|------------------------|--|
| <b>Customer Name:</b>  | <b>Turlock Irrigation District</b>                 |
| <b>Address:</b>        | <b>Post Office Box 949, Turlock, CA 95381-0949</b> |
| <b>Contact Person:</b> | <b>Cory R. Sobotta</b>                             |
| <b>Title:</b>          | <b>Utility Analyst II</b>                          |
| <b>Phone Number:</b>   | <b>(209) 883-8337</b>                              |
| <b>E-Mail Address:</b> | <b>crsobotta@tid.org</b>                           |
| <b>Website:</b>        | <b>www.tid.org</b>                                 |

**Type of Customer:**

(Check one as applicable)

|                                     |                              |
|-------------------------------------|------------------------------|
| <input type="checkbox"/>            | <b>Municipal</b>             |
| <input type="checkbox"/>            | <b>State</b>                 |
| <input type="checkbox"/>            | <b>Federal</b>               |
| <input checked="" type="checkbox"/> | <b>Irrigation District</b>   |
| <input type="checkbox"/>            | <b>Water District</b>        |
| <input type="checkbox"/>            | <b>Other (Specify) _____</b> |

**Identification of Resource Options (considerations that may be used to develop potential options include cost, market potential, consumer preferences, environmental impacts, demand or energy impacts, implementation issues, revenue impacts, and commercial availability):**

Supply-side options:

(Including, but not limited to: purchase power contracts and conventional and renewable generation)

| List existing supply-side options:            | List future supply-side resource options considered and evaluated: |
|---|--|
| <b>See Attachment A – Supply-Side Options</b> |  |
|   |  |
|   |  |
|   |  |
|   |  |

Demand-side options:

| List existing demand-side options:            | List future demand-side resource options considered and evaluated: |
|---|--|
| <b>See Attachment B – Demand-Side Options</b> |  |
|   |  |
|   |  |
|   |  |
|   |  |

Resource options chosen:

(Provide a narrative statement that describes the option chosen and clearly demonstrates that decisions were based on a reasonable analysis of the options)

**When evaluating resource and demand-side options, TID considers several factors such as cost, operating flexibility, the type of technology (i.e. whether it is a proven and commercially available resource or technology) environmental impacts, TID policies affecting power supply (i.e. TID’s Renewable Portfolio Standard), applicable NERC and WECC requirements, and applicable state and federal mandates (i.e. AB 2021, SB 1368, AB 32, SB1x2, SB350, SB100, SB1020). This approach has ensured that TID complies with all applicable mandates and still maintains the lowest electric rates in California.**

**TID has chosen to employ demand-side programs that are determined to be cost-effective and that would yield substantial demand and energy savings determined using industry accepted and widely used methodologies.**

**In order to help reduce its greenhouse gas emissions and meet its renewable resource requirements, in 2009 TID acquired a 136.6 MW wind farm that produces on the order of 300-400,000 MWH’s per year of clean, renewable energy. This resource has allowed TID to bank RECs for future use, as well as paved the way for a layering strategy wherein TID can acquire more renewables as prices fall, thus minimizing ratepayer impact. Continuing this strategy, in late 2015 TID signed a PPA for the entire output of a 54 MW solar project that began deliveries in 2017, and in 2017 signed a PPA for a share of a biomass plant that began deliveries in April 2018. TID is actively looking at the economics of both**

**renewables and energy storage in order to meet our renewables requirements and reliability needs at the lowest cost to our ratepayers.**

**TID has also recently adopted aggressive energy efficiency goals for the years 2022-2031 in the pursuit of reducing peak load and reducing the need for additional supply-side resources, thereby reducing emissions (see Attachment B for more details).**

**Action Plan:**

**Specific Action Items to be Implemented Over the Next 5 Years:**

(Lists are not meant to be inclusive, complete and provide other action items as applicable)

**Energy Consumption Improvements:**

| <b>Proposed Items</b>                          | <b>Begin Date</b>       | <b>End Date</b> | <b>Est. kW capacity savings per year</b> | <b>Est. kWh savings per year</b> | <b>Milestones to evaluate accomplishments</b> |
|--|-------------------------|-----------------|--|----------------------------------|---|
| Boiler, Furnace, air conditioning retrofits    | <b>See Attachment B</b> |                 |  |                                  |   |
| Weatherization, insulation storm windows/doors |                         |                 |  |                                  |   |
| Insulation of air ducts, boilers, pipes, etc.  |                         |                 |  |                                  |   |
| Clock thermostats and equipment system timers  |                         |                 |  |                                  |   |
| Heat pumps                                     |                         |                 |  |                                  |   |
| Energy audits                                  |                         |                 |  |                                  |   |
| Public education programs                      |                         |                 |  |                                  |   |
| Loan arrangements or rebate program for energy |                         |                 |  |                                  |   |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
| efficient equipment                                  |  |  |  |  |  |
| Use of infrared heat detection equipment             |  |  |  |  |  |
| Energy efficient lighting                            |  |  |  |  |  |
| Equipment inspection programs                        |  |  |  |  |  |
| Electric motor replacements                          |  |  |  |  |  |
| Upgrading of distribution lines/substation equipment |  |  |  |  |  |
| Power factor improvement                             |  |  |  |  |  |
| Other:   |  |  |  |  |  |

**Renewable Energy Activities:**

| Proposed Items                      | Begin Date                                 | End Date | Est. kW savings per year | Est. kWh savings per year | Milestones to evaluate accomplishments |
|-------------------------------------|--|----------|--------------------------|---------------------------|--|
| Solar thermal/photovoltaic projects | <b>See Attachment A &amp; Attachment B</b> |          |                          |                           |  |
| Day lighting technologies           |  |          |                          |                           |  |
| Active solar installations          |  |          |                          |                           |  |
| Active solar installations          |  |          |                          |                           |  |
| Biomass/refuse-derived fuels        |  |          |                          |                           |  |
| Geothermal projects                 |  |          |                          |                           |  |
| Small-scale hydro projects          |  |          |                          |                           |  |
| Other:                              |  |          |                          |                           |  |

**Load Management Techniques:**

| Proposed Items                          | Begin Date  | End Date | Est. kW savings per year | Est. kWh savings per year | Milestones to evaluate accomplishments |
|---|---|----------|--------------------------|---------------------------|--|
| Load management devices/systems         |   |          |                          |                           |  |
| Demand control techniques and equipment |   |          |                          |                           |  |
| Smart meters or automated equipment     |   |          |                          |                           |  |
| Time-of-use meters                      | TID has used TOU meters on certain rate classes for several years, but does not measure savings resulting from the use of TOU meters. |          |                          |                           |  |
| Other:                                  |   |          |                          |                           |  |

**Rate Design Improvements:**

| Proposed Items                       | Begin Date | End Date | Est. kW savings per year | Est. kWh savings per year | Milestones to evaluate accomplishments |
|--------------------------------------|------------|----------|--------------------------|---------------------------|--|
| Cost-of-service pricing              |            |          |                          |                           |  |
| Elimination of declining block rates |            |          |                          |                           |  |

|                     |   |  |  |  |  |
|---------------------|---|--|--|--|--|
| Time-of-day rates   | TID has used TOD rates on several rate classes for several years, but does not measure savings based on these rates.  |  |  |  |  |
| Seasonal rates      | TID has had seasonal rates on most rate classes for several years, but does not measure savings based on these rates. |  |  |  |  |
| Interruptible rates |   |  |  |  |  |
| Other:              |   |  |  |  |  |

**Agricultural Improvements:**

| Proposed Items                                     | Begin Date              | End Date | Est. kW savings per year | Est. kWh savings per year | Milestones to evaluate accomplishments |
|--|-------------------------|----------|--------------------------|---------------------------|--|
| Irrigation pump utilization/scheduling             | <b>See Attachment B</b> |          |                          |                           |  |
| Irrigation pump testing or efficiency improvements |                         |          |                          |                           |  |
| Electric motor replacement                         |                         |          |                          |                           |  |
| Photovoltaic pumping systems                       |                         |          |                          |                           |  |
| Ditch lining or piping                             |                         |          |                          |                           |  |
| Laser land leveling                                |                         |          |                          |                           |  |
| Pumpback systems                                   |                         |          |                          |                           |  |
| Water conservation programs                        |                         |          |                          |                           |  |
| Other:   |                         |          |                          |                           |  |

**Environmental Effects:**

(Provide a narrative statement that sets forth the efforts taken to minimize adverse environmental effects of new resource acquisitions)

**As discussed in the narrative on Resource options chosen and Attachment A, TID considers several factors in evaluating resource options, including environmental impacts of a resource option, and how the resource will help TID achieve its Renewable Portfolio Standard (RPS), Energy Efficiency Targets, and other environmentally related state and federal mandates such as AB2021, SB1368, SB1x2, AB32, SB 350, SB 100 and SB 1020. For example, in order to meet its RPS and reduce greenhouse gas emissions, TID has acquired a 136.6 MW wind farm in Washington state that typically produces 300-400,000 MWh's of clean, GHG-free energy per year. This resource is in addition to TID's existing renewable and/or environmentally friendly resources consisting of small hydro, large hydro, and geothermal generation, and from power contracts sourced from renewable and/or environmentally friendly resources. TID also signed a PPA in late 2015 for the entire output of a 54 MW solar project which began delivering in 2017 and will produce over 150,000 MWh per year of clean, renewable energy for 20 years. Finally, TID signed a contract for a share of a biomass plant in order to comply with SB 859, and is actively looking at the economics of both renewables and energy storage to ensure it meets environmental mandates as cost-effectively as possible.**

TID has also recently adopted aggressive energy efficiency goals for the years 2022-2031 in the pursuit of reducing peak load and reducing the need for additional supply-side resources, thereby reducing emissions and helping to safeguard the environment (see Attachment B for more details).

TID's Solar Rebate Program to date has resulted in over 980 customer solar installations totaling over 20 MW.

**Public Participation:**

(Customers must provide ample opportunity for full public participation in preparing and developing an IRP. Provide a brief description of public involvement activities, including how information was gathered from the public, how public concerns were identified, how information was shared with the public, and how it responded to the public comments)

**Significant new resource additions are generally approved by TID's Board of Directors during regularly scheduled public meetings that allow for public participation. Furthermore, for new generation additions, those additions go through applicable state and local permitting processes that allow for public**

**participation. Turlock Irrigation District's Energy Efficiency Goals were also adopted by the TID Board of Directors at a regularly scheduled public board meeting.**

**Future Energy Service Projections:**

(Provide a load forecast to show expected growth or expansion; or a narrative statement concerning expected future growth)

| Calendar Year | Peak Demand (kW) <sup>1</sup> | Total Energy (kWh) <sup>1</sup> |
|---------------|-------------------------------|---------------------------------|
| 2024          | 601,880                       | 2,411,737,000                   |
| 2025          | 605,020                       | 2,421,720,000                   |
| 2026          | 606,580                       | 2,427,856,000                   |
| 2027          | 609,440                       | 2,436,620,000                   |
| 2028          | 612,180                       | 2,446,350,000                   |

or Narrative Statement:

<sup>1</sup>Based on TID’s load forecast as of June 2022.

**Measurement Strategies:**

(Provide a brief description of measurement strategies for options identified in the IRP to determine whether the IRP’s objectives are being met. These validation methods must include identification of the baseline from which a customer will measure the benefits of its IRP implementation)

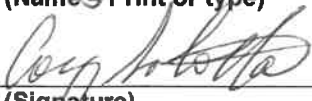
**TID regularly measures its actual energy efficiency savings using industry accepted and widely used methodologies (such as utility staff pre- and post-installation inspections, third-party engineering estimates of energy savings, and random sampling/audits of small commercial and residential programs for verification of installation and energy savings) to monitor its progress toward meeting its energy efficiency goals. TID’s 2022 savings from energy efficiency programs was approximately 561 kilowatts and 4.63 million kilowatt hours. The savings achieved, program cost-effectiveness and expenditures are reported periodically to TID’s Board and state agencies. Since 2008, this report has also included an independent, third party evaluation that measures and verifies the reported energy efficiency savings. TID revisits the adopted goals on a periodic basis and makes adjustments to future goals as necessary.**

**TID is actively planning to meet the SB 100 requirement of 100% carbon free power by 2045, and the requirement that at least 60% of this be from renewable resources. TID also regularly monitors its renewable position; TID’s 2022 energy mix included approximately 52% from renewable and GHG-free sources. TID reviews its actual power supply mix on an annual basis and compares them to prior resource plans and applicable renewable and emissions mandates to inform future resource plans and needed courses of action. TID’s renewable generation percentage is submitted yearly to the California Energy Commission as part of their Power Source Disclosure (SB 1305) Program. TID also regularly monitors its GHG emissions and reports annually to the ARB.**



**IRP Approval:**

(Indicate that all of the IRP requirements have been met by having the responsible official sign below; or provide documentation that the IRP has been approved by the appropriate governing body)

|   |                                      |
|---|--------------------------------------|
| <u>Cory Sobotta</u><br>(Name - Print or type)   | <u>Utility Analyst II</u><br>(Title) |
| <u></u><br>(Signature) | <u>6/30/23</u><br>(Date)             |

**Other Information:**

(Provide/attach additional information if necessary)

## **Attachment A Supply-Side Options**

TID plans to rely on a combination of existing owned generation resources, existing long-term contracts, short-term market purchases, energy efficiency programs and future renewable and energy storage resources to meet our capacity, energy, renewable, and energy efficiency requirements. By relying on such a diverse portfolio of resources, TID will be able to provide reliable and safe electric service to its customers at lower cost while reducing its environmental impact.

In order to help reduce its greenhouse gas emissions and meet applicable renewable resource mandates, TID acquired a 136.6 megawatt wind generation project located in Washington State in 2009. This resource delivers around 300-400,000 MWh of clean, GHG-free electricity per year. Since the passage of SB350, SB100 and SB 1020, and their increasing requirements for electricity sales to be provided by renewables, TID has been constantly evaluating market conditions and renewable prices in order to make the best use of ratepayer funds. In order to help meet the increased renewables mandate TID signed a 20-year power purchase agreement for the entire output of a 54 MW solar farm in November 2015, as well as a contract for a share of a biomass plant pursuant to SB 859 in late 2017.

The following pages contain TID's peak electric load resource balance forecasts for 2019 through 2023, which are based on TID's annual resource planning activities.

**Turlock Irrigation District  
TID Peak Electric Load Resource Balance at Westley (MW)**

| <b>Year</b>                          | <b>2024</b>  | <b>2025</b>  | <b>2026</b>  | <b>2027</b>  | <b>2028</b>  |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Hydro</b>                         |              |              |              |              |              |
| Don Pedro                            | 99.9         | 113.1        | 126.4        | 153.2        | 138.2        |
| La Grange                            | 4.7          | 4.7          | 4.7          | 4.7          | 4.7          |
| Hickman                              | 1.1          | 1.1          | 1.1          | 1.1          | 1.1          |
| Turlock Lake                         | 3.3          | 3.3          | 3.3          | 3.3          | 3.3          |
| Upper Dawson                         | 4.4          | 4.4          | 4.4          | 4.4          | 4.4          |
| <b>Total Hydro</b>                   | <b>113.4</b> | <b>126.6</b> | <b>139.9</b> | <b>166.7</b> | <b>151.7</b> |
| <b>Coal</b>                          |              |              |              |              |              |
|                                      |              |              |              |              |              |
| <b>Geothermal</b>                    |              |              |              |              |              |
| NCPA                                 | 5.75         | 5.70         | 5.66         | 5.62         | 5.58         |
| <b>Natural Gas</b>                   |              |              |              |              |              |
| Walnut                               | 49.6         | 49.6         | 49.6         | 49.6         | 49.6         |
| Almond                               | 189.2        | 189.2        | 189.2        | 189.2        | 189.2        |
| WEC                                  | 238.1        | 238.1        | 238.1        | 238.1        | 238.1        |
| <b>Total Natural Gas</b>             | <b>476.9</b> | <b>476.9</b> | <b>476.9</b> | <b>476.9</b> | <b>476.9</b> |
| <b>Other/Renewable</b>               |              |              |              |              |              |
| CCSF Class 1                         | -            | -            | -            | -            | -            |
| CCSF Excess                          | -            | -            | -            | -            | -            |
| WAPA                                 | -            | -            | -            | -            | -            |
| Tuolumne Wind Project                | -            | -            | -            | -            | -            |
| Rosamond Solar                       | 7.78         | 7.78         | 7.78         | 7.78         | 7.78         |
| Biomass                              | -            | -            | -            | -            | -            |
| <b>Total Other/Renewable</b>         | <b>7.78</b>  | <b>7.78</b>  | <b>7.78</b>  | <b>7.78</b>  | <b>7.78</b>  |
| <b>Total Resources<sup>1,2</sup></b> | <b>603.8</b> | <b>617.0</b> | <b>630.2</b> | <b>657.0</b> | <b>642.0</b> |

<sup>1</sup> This number does not include market purchases, which in any given year could be substantial.

<sup>2</sup> Based on 2022 modeling. In compliance with SB350, TID is in the process of developing an updated IRP which may show a different resource mix than shown above.

**Turlock Irrigation District  
TID Peak Electric Load Resource Balance at Westley (MWh)**

| <b>Year</b>                          | <b>2024</b>      | <b>2025</b>      | <b>2026</b>      | <b>2027</b>      | <b>2028</b>      |
|--------------------------------------|------------------|------------------|------------------|------------------|------------------|
| <b>Hydro</b>                         |                  |                  |                  |                  |                  |
| Don Pedro                            | 362,081          | 357,709          | 370,781          | 357,512          | 365,583          |
| La Grange                            | 24,040           | 24,238           | 24,118           | 24,172           | 23,915           |
| Hickman                              | 5,313            | 5,300            | 5,222            | 5,270            | 5,240            |
| Turlock Lake                         | 11,137           | 11,103           | 10,896           | 10,892           | 10,966           |
| Upper Dawson                         | 12,645           | 12,722           | 12,511           | 12,576           | 12,620           |
| <b>Total Hydro</b>                   | <b>415,216</b>   | <b>411,072</b>   | <b>423,528</b>   | <b>410,422</b>   | <b>418,324</b>   |
| <b>Coal</b>                          |                  |                  |                  |                  |                  |
|                                      |                  |                  |                  |                  |                  |
| <b>Geothermal</b>                    |                  |                  |                  |                  |                  |
| NCPA                                 | 43,898           | 42,568           | 42,216           | 41,475           | 38,715           |
| <b>Natural Gas</b>                   |                  |                  |                  |                  |                  |
| Walnut                               | -                | -                | -                | -                | -                |
| Almond                               | 204,877          | 200,294          | 180,203          | 186,863          | 213,292          |
| WEC                                  | 1,415,587        | 1,001,335        | 870,165          | 780,098          | 573,619          |
| <b>Total Natural Gas</b>             | <b>1,620,464</b> | <b>1,201,629</b> | <b>1,050,368</b> | <b>966,961</b>   | <b>786,911</b>   |
| <b>Other/Renewable</b>               |                  |                  |                  |                  |                  |
| CCSF Class 1                         | -                | -                | -                | -                | -                |
| CCSF Excess                          | -                | -                | -                | -                | -                |
| WAPA                                 | 10,326           | 20,102           | 20,102           | 20,102           | 20,102           |
| Tuolumne Wind Project                | 378,019          | 377,531          | 377,531          | 377,531          | 378,019          |
| Rosamond Solar                       | 156,422          | 156,178          | 155,631          | 154,594          | 154,337          |
| Biomass                              | -                | -                | -                | -                | -                |
| <b>Total Other/Renewable</b>         | <b>544,767</b>   | <b>553,811</b>   | <b>553,264</b>   | <b>552,227</b>   | <b>552,458</b>   |
| <b>Total Resources<sup>1,2</sup></b> | <b>2,624,345</b> | <b>2,209,080</b> | <b>2,069,376</b> | <b>1,971,085</b> | <b>1,796,408</b> |

<sup>1</sup> This number does not include market purchases, which in any given year could be substantial.

<sup>2</sup> Based on 2022 modeling. In compliance with SB350, TID is in the process of developing an updated IRP which may show a different resource mix than shown above.

## **Attachment B Demand-Side Options Turlock Irrigation District**

For more than a decade, TID has offered rebates along with energy audits to educate customers about energy efficiency measures and help them reduce energy consumption. Existing successful programs will be continued and new and innovative programs will be added.

On March 9, 2021 TID established, and the TID Board of Directors adopted, updated energy efficiency goals for 2022-2031. These goals are revisited every four years, allowing TID to identify new technologies and programs that can save ratepayers money. TID's 2022 energy efficiency programs saved approximately 4.63 million kilowatt hours.

TID is continually evaluating the cost-effectiveness of existing and potential new energy efficiency programs, and plans to meet its energy efficiency goals for 2024 to 2028 through the use of existing programs and by adding new cost-effective programs. TID intends to acquire all available energy efficiency that is cost-effective, reliable, and feasible. Following is a list of TID's current energy efficiency programs:

### **Commercial, Industrial and Agricultural Customer Programs**

- Meter Manager – TID offers an on-line energy management tool for business customers so they can monitor their energy usage and utilize that information to more efficiently manage their energy consumption simply by logging into a secure web site.
- Energy Audits - TID offers free on-site energy audits to commercial, industrial and agricultural customers who have concerns, questions or an interest in implementing measures to manage their energy usage and reduce consumption.
- Commercial, Industrial, Agricultural Energy Efficiency Rebates - TID offers rebates along with comprehensive technical support for all commercial, industrial and agricultural customers to promote the purchase and installation of commercial equipment and systems that support and enhance load reduction.
- Commercial Rebate Programs - TID offers customers rebates for purchasing and installing:
  - Commercial Refrigeration
  - Commercial Lighting – Lighting – Non-Res Lighting
  - Agricultural Irrigation Pump
  - Dairy Fans
  - Commercial HVAC
  - Commercial Smart Thermostats

### **Residential Customer Programs**

- Residential Energy Audits - TID provides free in-home energy audits to customers who would like to learn how to reduce their energy use.
- Residential Rebate Programs - TID offers customers rebates for purchasing and installing:
  - Energy Star Refrigerator
  - Energy Star Room AC
  - Energy Star Clothes Washer
  - Whole House Fan
  - Shade Screens
  - Energy Star Pool Pump
  - Energy Star Ductless Mini Split Air Conditioner
  - Central Air Conditioner
  - High Efficiency Central Air Conditioner
  - Central Heat Pump
  - HVAC Tune Up
  - Induction Stovetop
  - Heat Pump Water Heater
- Shade Tree Rebate - TID provides rebates for up to three trees per year that are planted to provide shade.

**TID Energy Efficiency Goals  
For 2024 to 2028**

| Year | Annual Incremental Energy Savings Goal per year (kWh) | Estimated Annual Incremental Funding to meet Savings Goal * |
|------|---|---|
| 2024 | 11,078,000  | \$1,647,524   |
| 2025 | 10,359,000  | \$1,535,329   |
| 2026 | 10,055,000  | \$1,497,567   |
| 2027 | 9,728,000   | \$1,522,844   |
| 2028 | 9,697,000   | \$1,565,642   |

\* Funding estimates are the administrative and incentive costs output from the model used to establish the energy efficiency savings potential. Funding is not limited to the estimates provided. TID intends to fund all eligible energy efficiency program activities, including those that provide savings beyond the annual incremental energy savings goals.