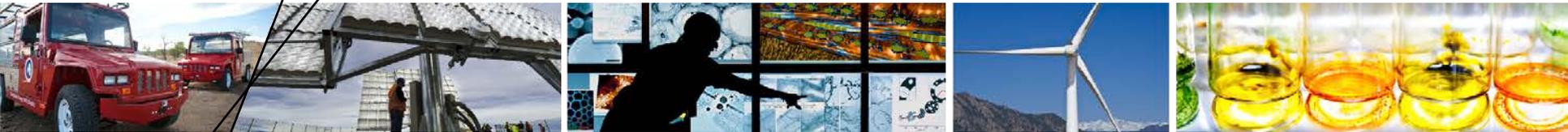




Distributed Generation Interconnection Collaborative (DGIC)



**“Distributed PV Interconnection Screening Procedures
and Online Tools”**

Joel Dickinson with Salt River Project Solar Initiatives Group

August 27, 2014

Speakers



Joel Dickinson
Sr. Engineer
Salt River Project



Kristen Ardani
Solar Analyst
National Renewable Energy Laboratory
(DGIC moderator)

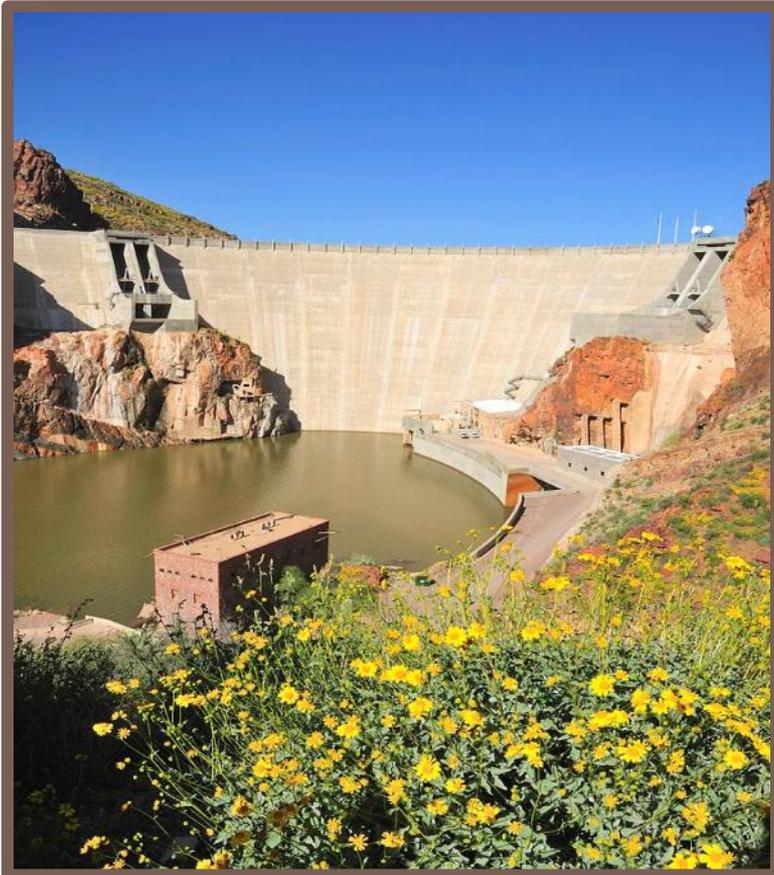
Distributed PV Interconnection Screening and Online Tools

**Joel Dickinson, P.E.
Sr. Engineer
Solar Initiatives**

August 27th, 2014

Salt River Project

4



- Established in 1903 after Theodore Roosevelt signed the National Reclamation Act of 1902
- Largest water supplier to the Valley of the Sun
- Third largest public power utility in the nation
- 970,000 electric customers
- 6,800 MW peak load

Sustainable Portfolio Overview

5



- ❑ Established by SRP Board
- ❑ 2001 – Allocated \$29 million; 4 year renewable program
- ❑ 2004 – Established sustainable portfolio (includes: renewable and energy efficiency measures) with target of 2% of retail sales by 2010
- ❑ 2006 – Target of 15% of retail sales by 2025
- ❑ 2011 – New target set at 20% by 2020 (includes energy efficiency)

Solar Incentive Programs

6

Solar incentive programs to date launched August 2004

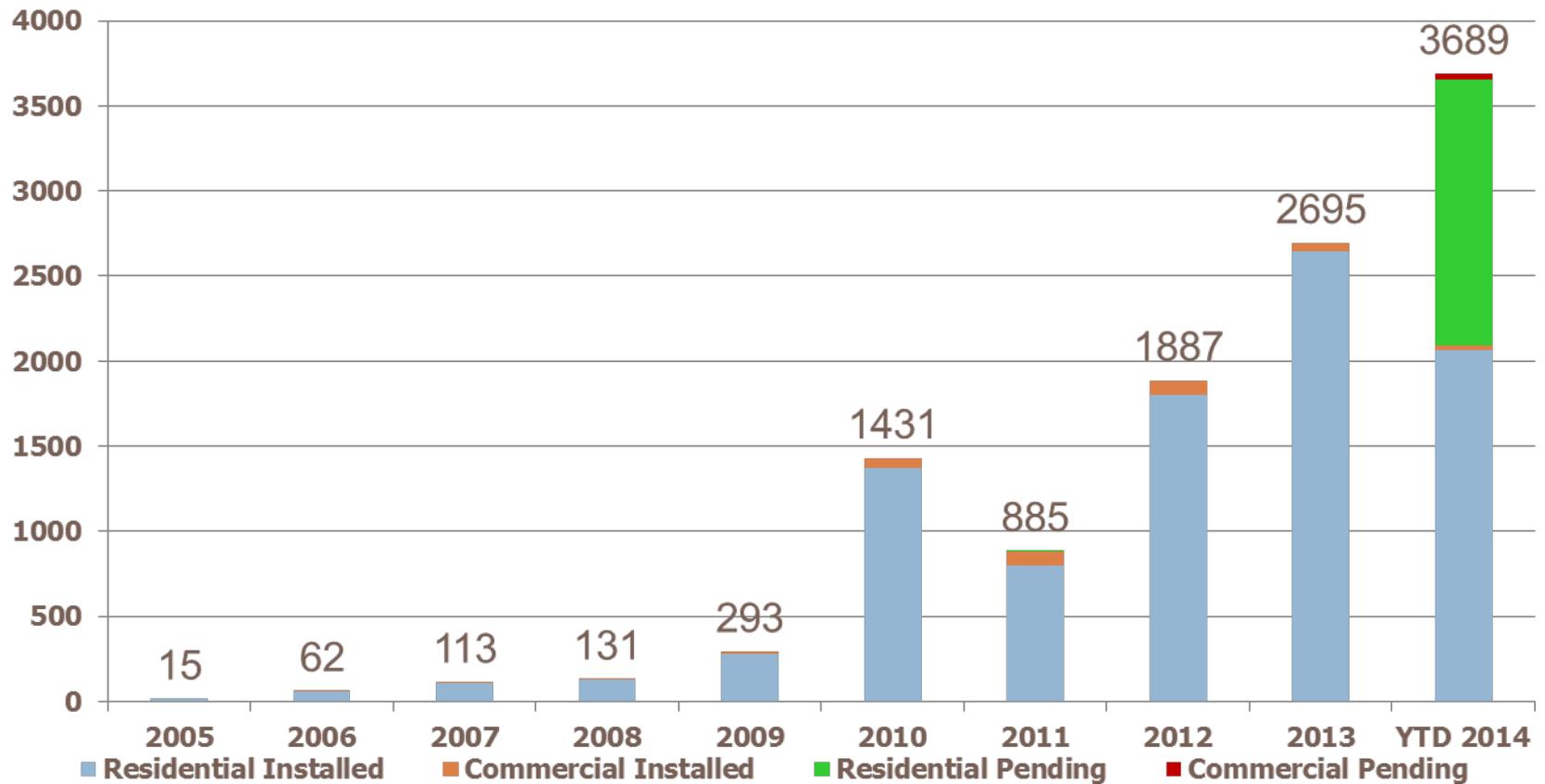
Program Description	Total Systems
Residential Solar Electric	10,543
Residential Solar Water Heating	7,653
Commercial Solar Electric	381
Commercial Solar Water Heating	75

*60.6 MW installed and 10.9 pending (Residential) and
31.6 MW installed and 6.5 pending (Commercial)*

109.8 MW total

Solar Electric Installations

7



Interconnection Options

8

- ❑ Load Customers: 12 kV and under
- ❑ Non-Load Customers: 12 kV and under
- ❑ Interconnector: 69 kV and above
 - ❑ Small Generator: 20 MW or less
 - ❑ Large Generator: above 20 MW



Photo Courtesy of SunPower Corporation

Program Details

9

- ❑ Distribution System
 - ❑ Up to 300 kW ac for net energy metering (NEM)
 - ❑ Above 1 MW additional design review considerations
- ❑ Transmission system
 - ❑ Eligible for buy back rider



Solar Program Documentation

12 kV and Below

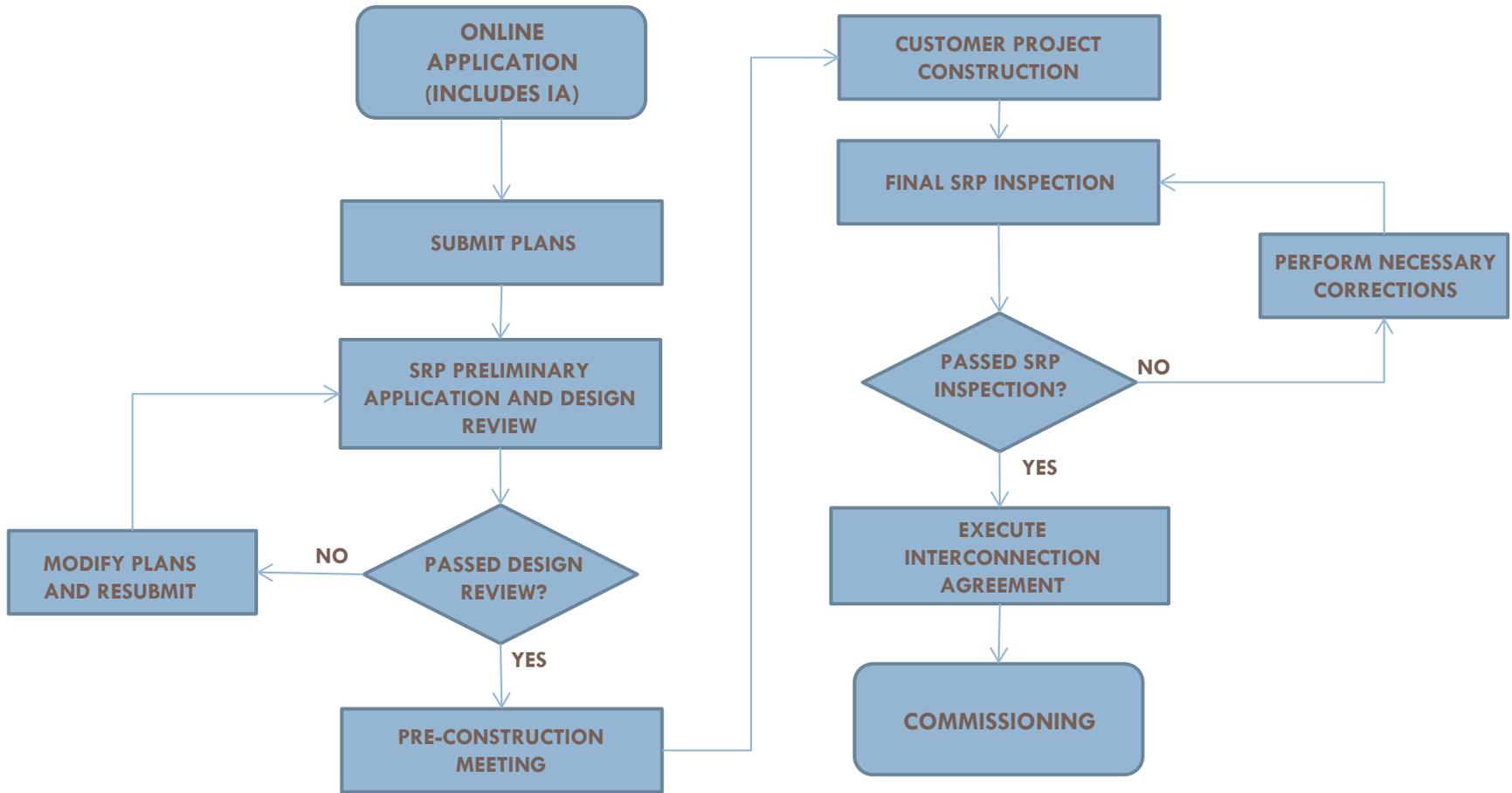
10

- Application
- Site Plan
- 3-Line Drawing
- Solar Contract
- Signed Interconnection Agreement before commissioning



Load Customer Interconnection Procedure

11



Distribution System Interconnection Procedure

12kV and Under

12

- ❑ Applies to Generating Facilities no larger than 20MW with voltages less than 69kV
- ❑ Interconnection Request – submitted with non-refundable fee
 - ❑ Scoping Meeting
 - ❑ Studies
 - ❑ Feasibility - identify potential major issues with equipment
 - ❑ Facilities - studies Reliability and System Impacts
- ❑ Design and Construction
 - ❑ Interconnection Facilities and System Upgrades needed to support interconnection and easements if needed
- ❑ Interconnection Agreement

Transmission Interconnection Procedure

Small and Large Generators connected to 69kV and above

13

- ❑ Interconnection Request- recorded on utility's Queue
- ❑ Studies
 - ❑ System Impact
 - ❑ Power flow, Short circuit, Stability
 - ❑ Facilities
- ❑ Design and Construction
 - ❑ Interconnection Facilities and System Upgrades needed to support interconnection and easements if needed
- ❑ Interconnection Agreement

SRP Customer Solar Plants

14



Photo Courtesy of Tom Schafer

Beverage Manufacturing, Tolleson:

500 kW + 1.5 MW (2 MW)



Box Store, Chandler:

300 kW x 2 (600 kW)

Copper Crossing Solar PV

15

- Online Sept. 1, 2011
- 20-megawatt AC facility
- Non- Load Customer at 12 kV
- SRP substation fed by 69 kV
- SunPower mono-crystalline panels with single axis tracking



In Conclusion

16

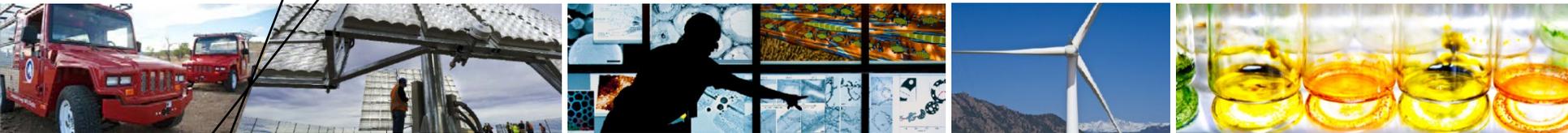
- ❑ SRP and the utility industry, face many challenges related to growth, climate change and balancing costs for our customers as we strive to provide a sustainable energy supply
- ❑ SRP has a wide array of “green” solutions for our customers to help them reduce energy costs, use water and energy more efficiently and implement renewable energy options to reduce their carbon footprint
- ❑ In an effort to reduce solar “soft” costs SRP is attempting to streamline and automate the interconnection process where possible

Questions?

17

Joel Dickinson, P.E.
Senior Engineer
SRP, Solar Initiatives
(602)236-2071
joel.dickinson@srpnet.com

For more information on the SRP Solar Energy
Program:
www.srpnet.com/solar



Thank you!

http://www.nrel.gov/tech_deployment/dgic.html