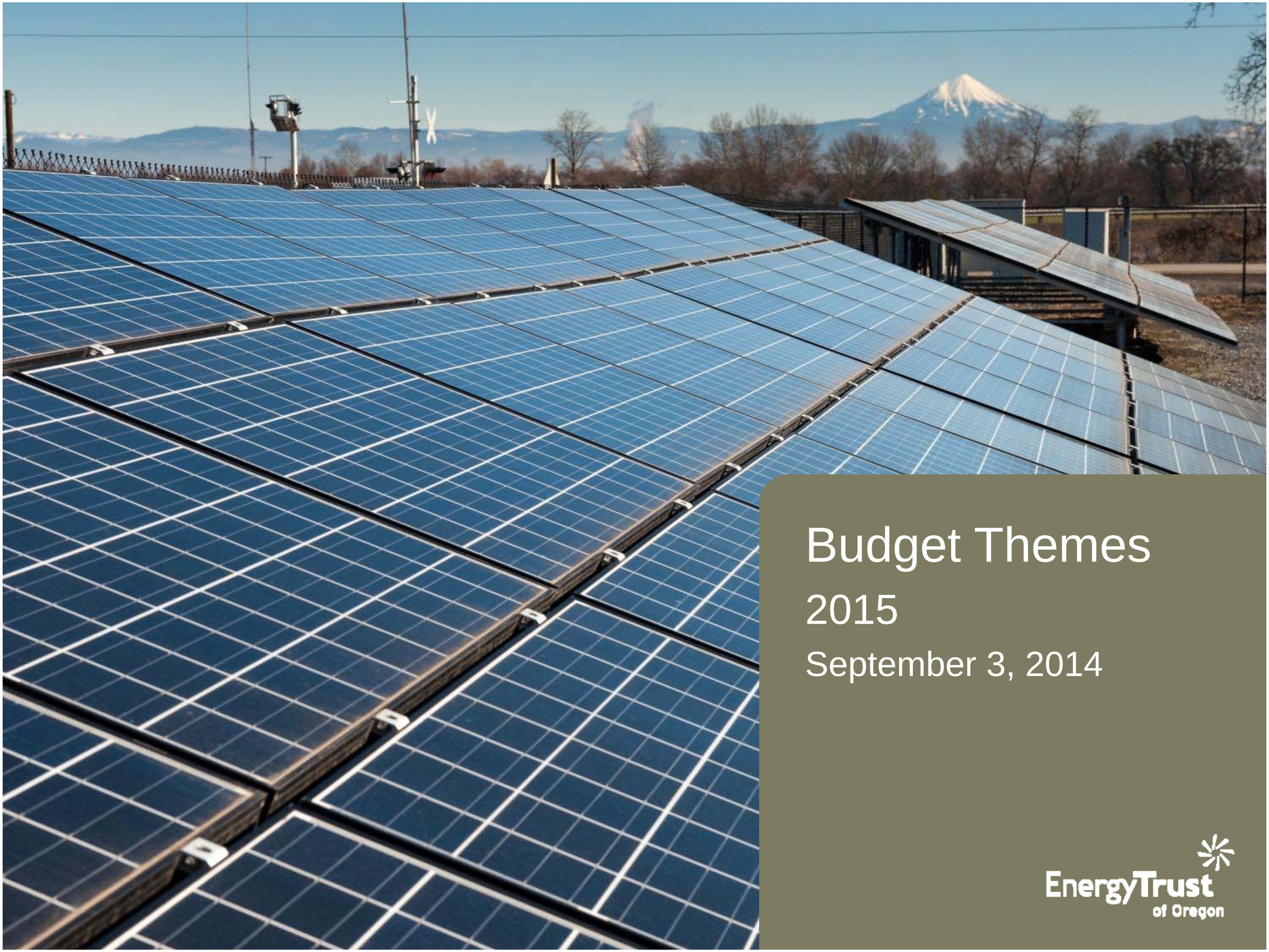


Budget Themes

2015

September 3, 2014

Energy Trust of Oregon

Renewables Sector
Budget Themes 2015

Current Market

- Market conditions challenging
  - Low avoided cost rates
  - Expired PTC
  - Limited statewide incentives

- Limited Funding

Budget Themes

- Support a sustainable market for small renewable generation across technologies
- Improve performance of projects across technologies
- Direct incentives where opportunities are available

Other Renewables

2014 Other Renewables Summary

Technology	Completed*	Underway	PDA
Biopower	0	2	2
Hydro	1	4	11
Geothermal	1	0	4
Wind	1	0	2

*Either already completed or completion expected in 2014

2014 Other Renewables Summary

- End of year – 1.2 aMW
- Short of 1.84 aMW budgeted goal
- Two biopower projects at dairies -- cancelled due to challenging market conditions

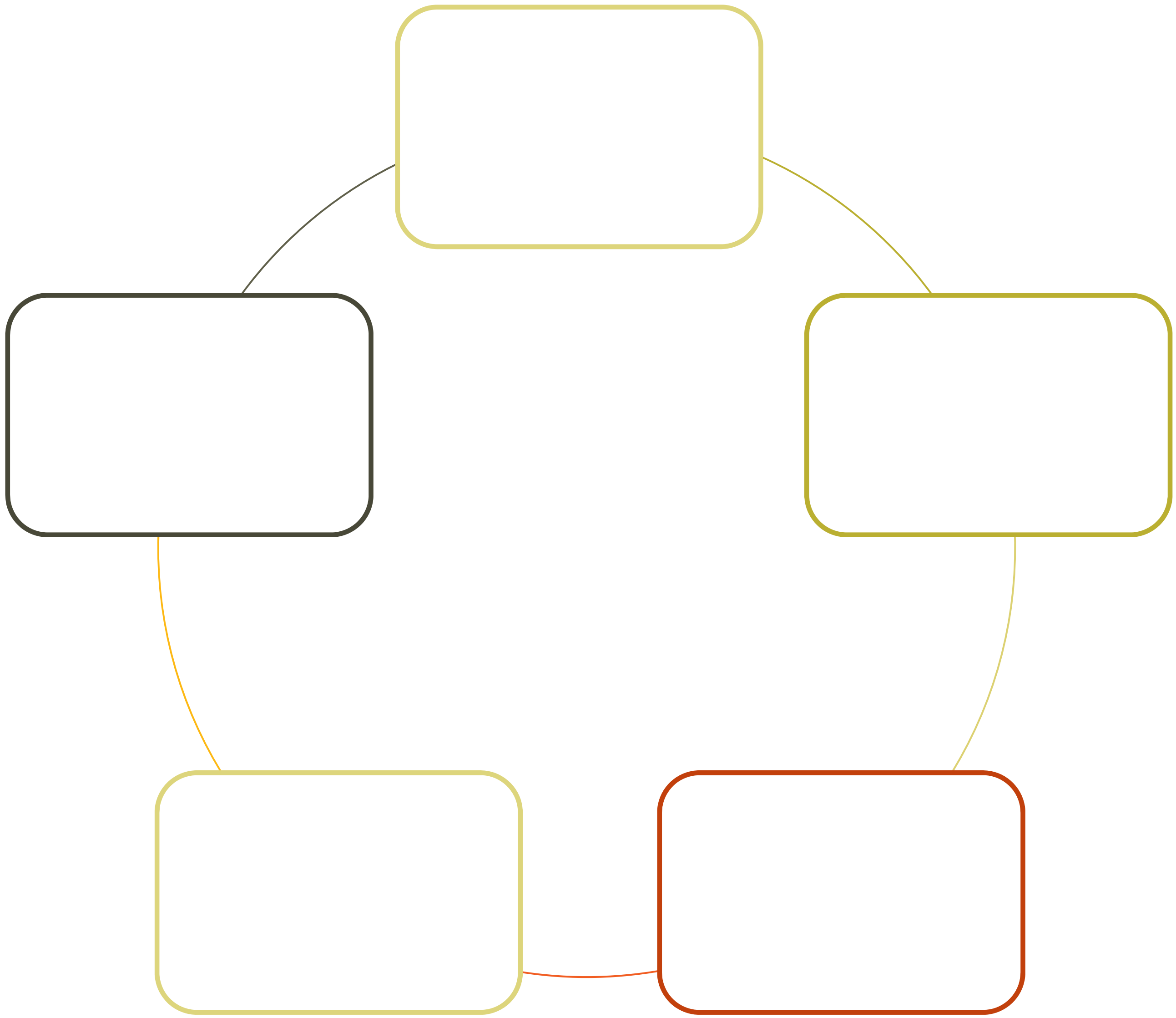
2015 -- Challenges

- Really low wholesale rates
    - Reduced pipeline
    - Better conditions in some other states
    - Transportation fuel market perceived to be attractive

It's tough out there

2015 -- Opportunities

Opportunities



2015 Key Actions and Initiatives

1) Pipeline development – studies, outreach, resource assessment, & collaboration with other organizations

- Primary focus on hydro and bio
- Remain open to other technologies

2015 Key Actions and Initiatives

2) Create new development pathways

- Innovative financing models
- Mentoring
- Collaboration with other organizations

2015 Key Actions and Initiatives

3) Improve project performance

- Examination of O & M costs for biopower projects
- Use information developed from existing projects

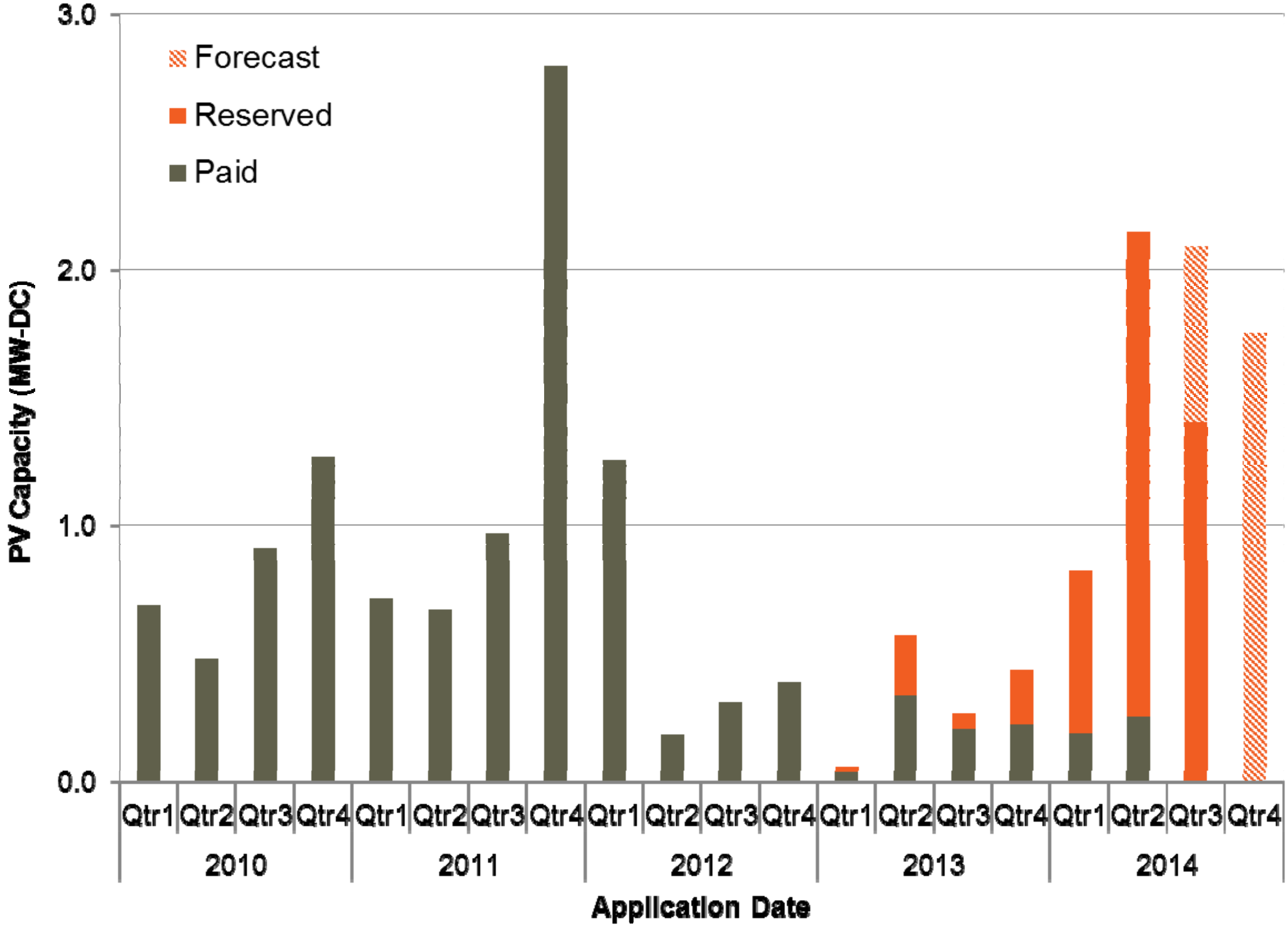
2015 Key Actions and Initiatives

4) Continue competitive processes

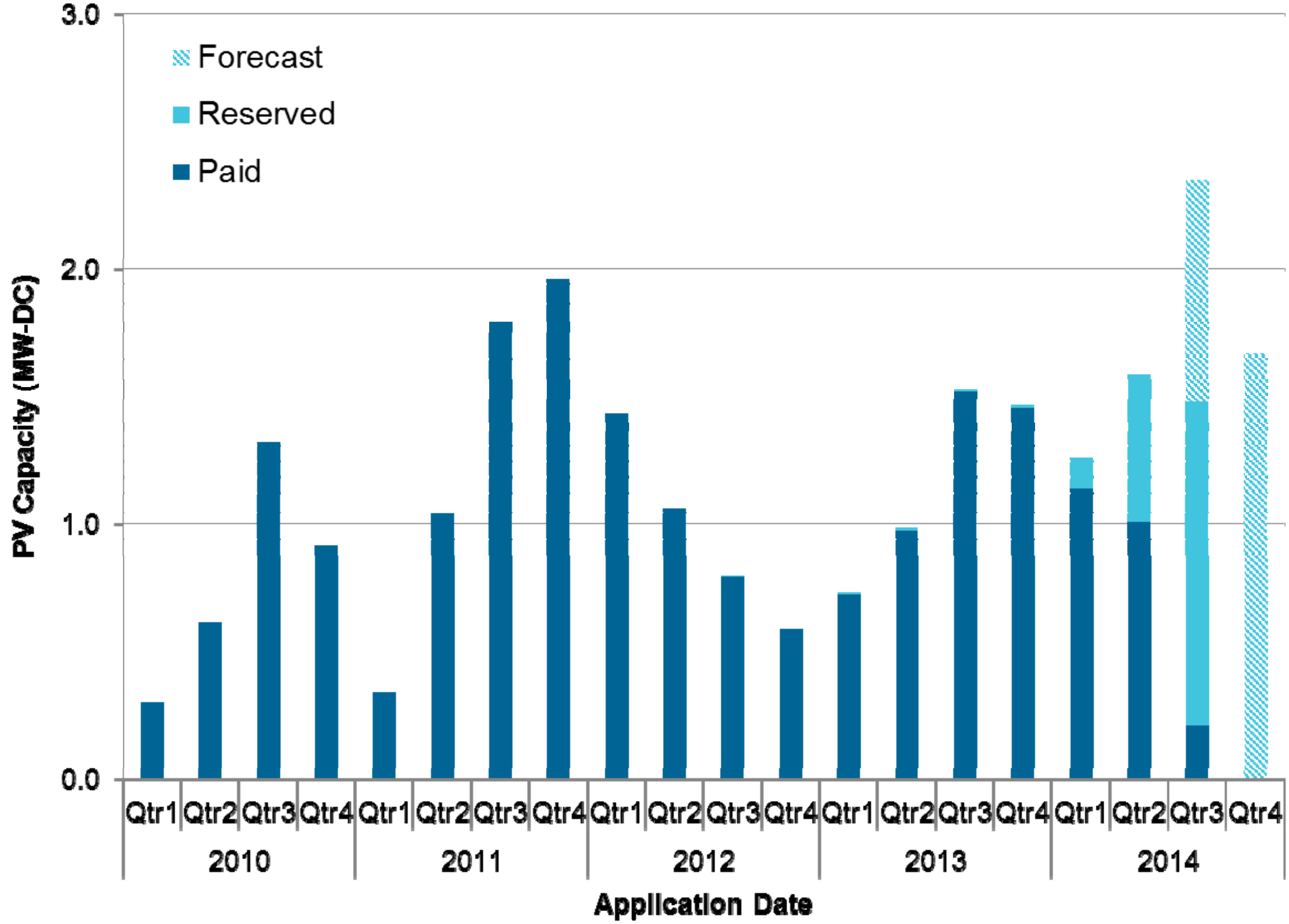
- Market becoming accustomed
- Twice-yearly for larger projects
- Continue to refine timing

Solar

2014: Commercial sales picking up



2014: Residential market growing



2014: Initial soft cost efforts underway

- Soft cost benchmarking survey
  - ✓ Collaborative effort to develop survey
  - ✓ Collecting responses from solar trade allies
  - ❑ Analysis and report for Q1, 2015

- Process improvements
  - ✓ Reduced application review time by 30%
  - ✓ Simplified project revision process
  - ❑ ODOE RETC integration, electronic signatures and document routing in the works

2014: Initial soft cost efforts underway

- Customer acquisition focus
  - ✓ Delivered sales training
  - ✓ Testing lead generation through Mapdwell pilot
  - ✓ Commercial market research complete
  - ❑ Residential market research underway

2015 Focus: Incentives

1) Continue momentum in standard program with predictable, small incentive reductions to allow for growth
2) If additional funding is available, support larger solar with competitive processes

2015 Focus: Soft Costs

1) Measure: report out on soft cost survey
2) Plan: support development of an Oregon solar soft cost roadmap
3) Start implementation: for now, continue initial focus on customer acquisition costs and process improvements

Thank You

EnergyTrust of Oregon

2014 competitive processes

Q1 process

- No project installation applications received
- Two applications for PDA – both were approved for funding

Q2 process

- Three project installation applications received
- Two were rejected; still evaluating the third

Hydropower Strategic Plan

September 3, 2014

Historical Context

Programmatic Focus: 2002 - Present

2002 – 2008: “Open Solicitation”

2009 – 2014: Hydro focus, testing and eval

2009 - 2014

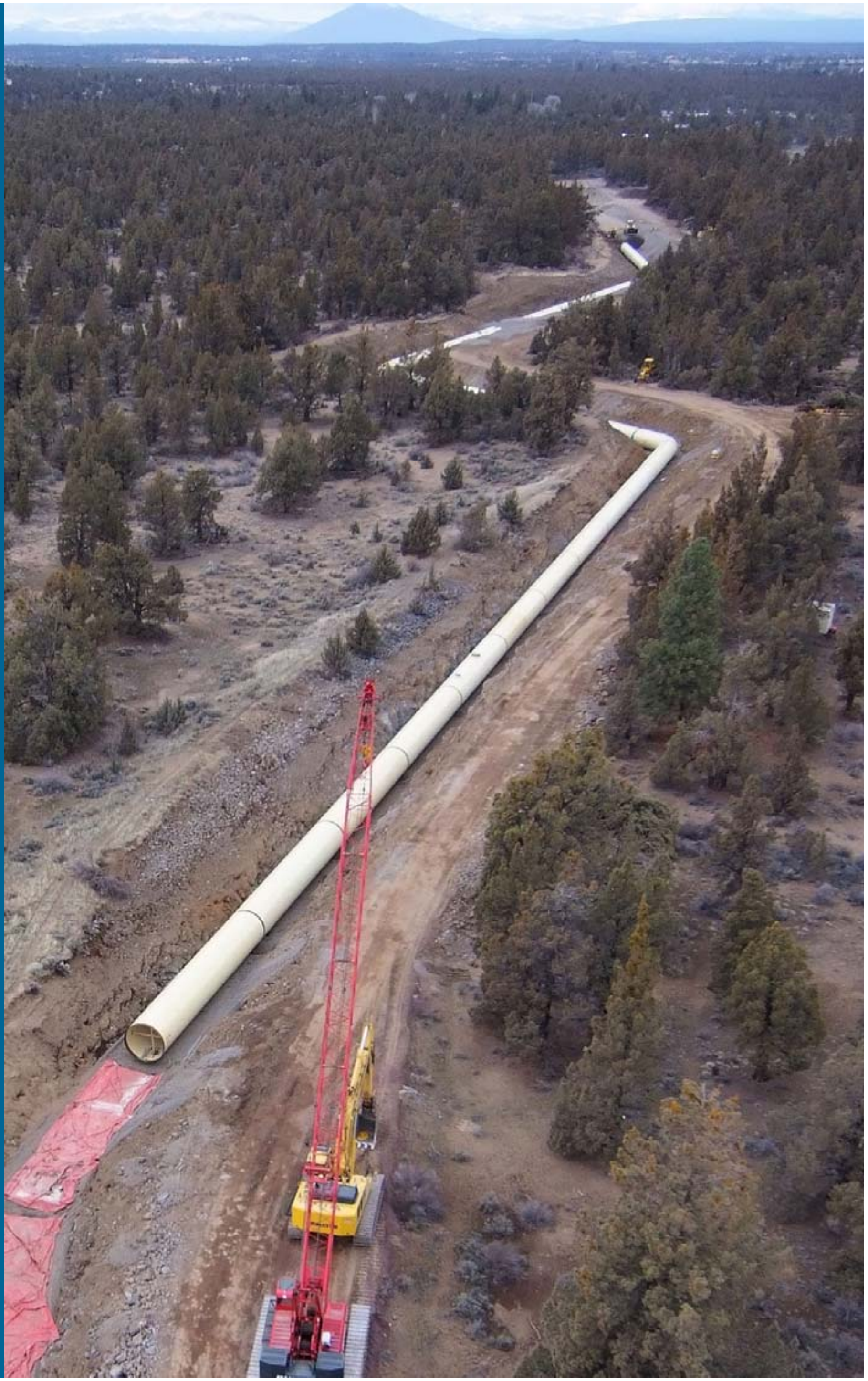
- Market Assessments
- Market Barriers
- Development Assistance
- Project Identification

Project Development Assistance and Installations after 2008

- PDA to more than 50 potential projects
- Incentives to 8 installations with 4 more "dedicated" for this year and beyond.
- 12 total installations (4 contracted prior to 2008)

Installations

Operational Projects	New Capacity kW
Municipal	511
Irrigation	5,000
Irrigation	-
Irrigation	-
Irrigation	-
Irrigation	1,100
Irrigation	11
Irrigation	750
Municipal PRV	25
Small Natural Stream	4
Municipal PRV	10
Irrigation	*700*
Total	**8,111**
Contracted projects	
Irrigation	-
Municipal PRV	30
Non powered irr dam	2,700
Irrigation	-
	2,730



Market Segments & Opportunities

Market Segments and Opportunities

Irrigation canal pressurizations

Pressure reduction valve replacements

Non-powered dam retrofits

Upgrades at existing small facilities

Aquifer storage and recovery

Natural streams

Project Owner Groups

- Irrigation Water Providers
- Irrigators
- Municipalities
- Private Developers

Technology & Cost

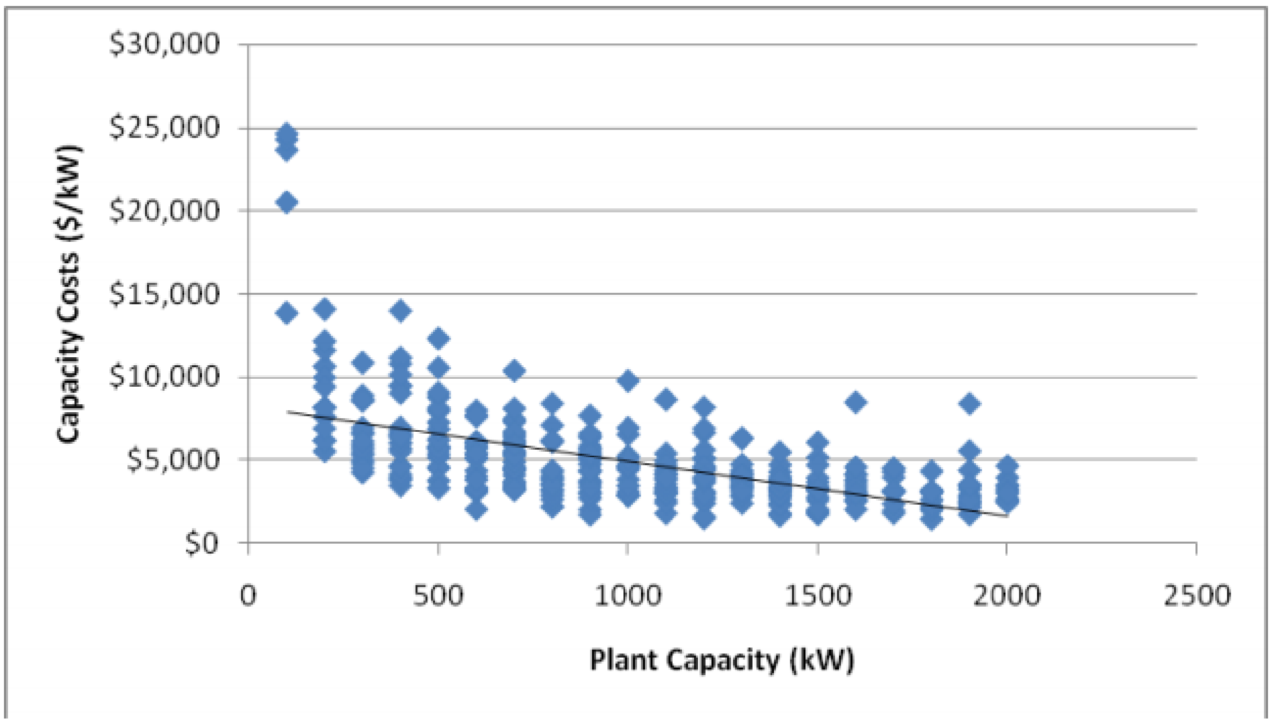
Technologies

- Mature, conventional technologies: Pelton, Francis, Turgo, Kaplan, Cross-flow, etc.

- New technologies: Natel hydroEngine, LucidPipe, Turbinator, others

Costs

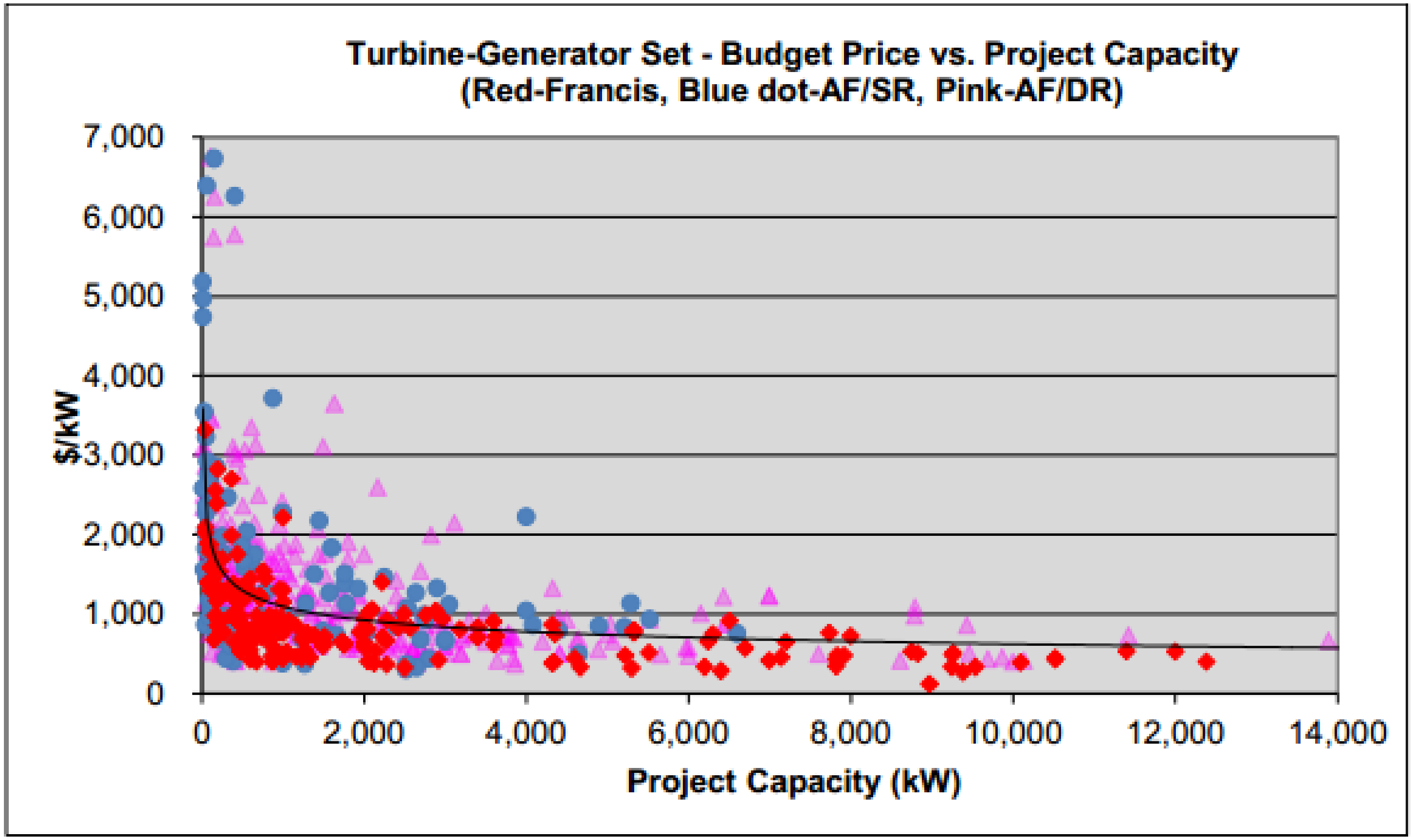
Very site dependent but generally go down as capacity increases



Source: Sigma Engineering Ltd., Green Energy Study for British Columbia Phase 2: Mainland (Vancouver, B.C. Canada, 2002)
Note: All costs are in Canadian dollars.

Costs cont.

Conventional turbine costs also go down as capacity increases



Other Market Actors

Other Market Actors

- Collaborative organizations
- Grant making groups and agencies
- Governments and permitting agencies
- Engineering and compliance firms
- Turbine manufacturers
- Utilities
- Trade associations

Future Scenarios

Future Scenarios

- Likely
- Better
- Worse

Goals

Goals

- Increase number of known project opportunities
- Acquire 1.5-3.5aMW of generation

Strategies

Strategies

- Project opportunity identification
- Development pathway improvement
- Resource agency outreach

Energy Trust's Hydro Strategy:
It's okay for the tail to wag the dog

Identifying opportunities for

water savings

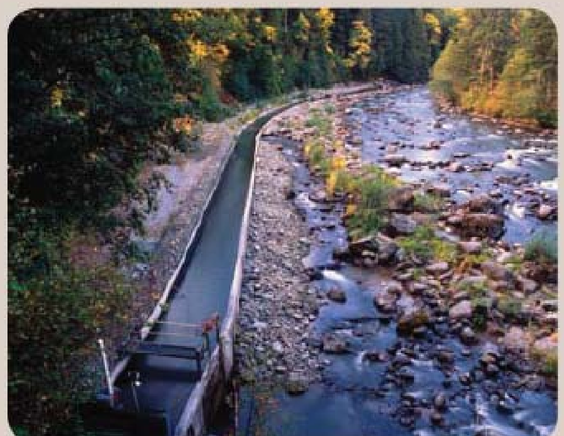
will help us get hydropower.

Cumulative Watershed Impacts of Small-Scale Hydroelectric Projects in Irrigation Delivery Systems: A Case Study

Prepared for Energy Trust of Oregon and Bonneville Environmental Foundation

By Les Perkins, Farmers Conservation Alliance (FCA)

June 2013



http://energytrust.org/library/case-studies/CS_Hydro_FCA_2013.pdf

The up-sides of water conservation

- Make the same deliveries with less water
- Resilience against changing water availability
- Energy savings / Energy generation
- Improved service(s) for patrons
- Reduced liabilities and canal maintenance
- Opportunities for improving relationships with resource agencies and conservation groups

The vision for irrigation districts…

- See the big picture…
  - Total delivery system evaluation
  - Strategic planning
  - Board training
- Prioritize opportunities
- Engage a team familiar with irrigation and hydropower

And for irrigators…

A low-cost or no-cost installation pathway

Opportunities

- Changing the hydro paradigm
- Hydro in support of conservation
- Winter water for negotiated periods in order to get more water savings over the long haul?

Other creative solutions

- Irrigation districts without hydro opportunities can invest in other district’s projects…

- DEQ SRF: Districts can lend to other districts or to their patrons to finance irrigation upgrades…

Discussion

Thank You

Jed Jorgensen

jed.jorgensen@energytrust.org

503.445.7611

EnergyTrust of Oregon

Solar

Residential activity strong

Energy Trust of Oregon

Commercial reservations picking up

Competitive solicitations

- Competitive bid process for PGE in Q2

Focus for 2015: incentives

Focus for 2015: soft costs

Measure

- Soft Cost Survey
- Market Research

Plan

- Energy Trust Strategy
- Oregon Solar Soft Cost Roadmap

Implement

- Internal Process Improvement
- Customer Acquisition Support
- Industry Process Improvement

Energy Trust of Oregon