

# **2012 Smart Grid Program Peer Review Meeting**

**Fort Collins RDSI Project**  
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Spirae Inc.

June 8, 2012

# Fort Collins RDSI

## Objective

- I. Demonstrate the ability to reduce electric system distribution feeder peak load by 20% or more through the coordinated use of Distributed Energy Resources (DER).
- II. Advance the expertise, technologies and infrastructure necessary to achieve the vision of the Fort Collins Zero Energy District (FortZED)



## Life-cycle Funding

**FY09 – FY12**

**DOE: \$6,323,380**

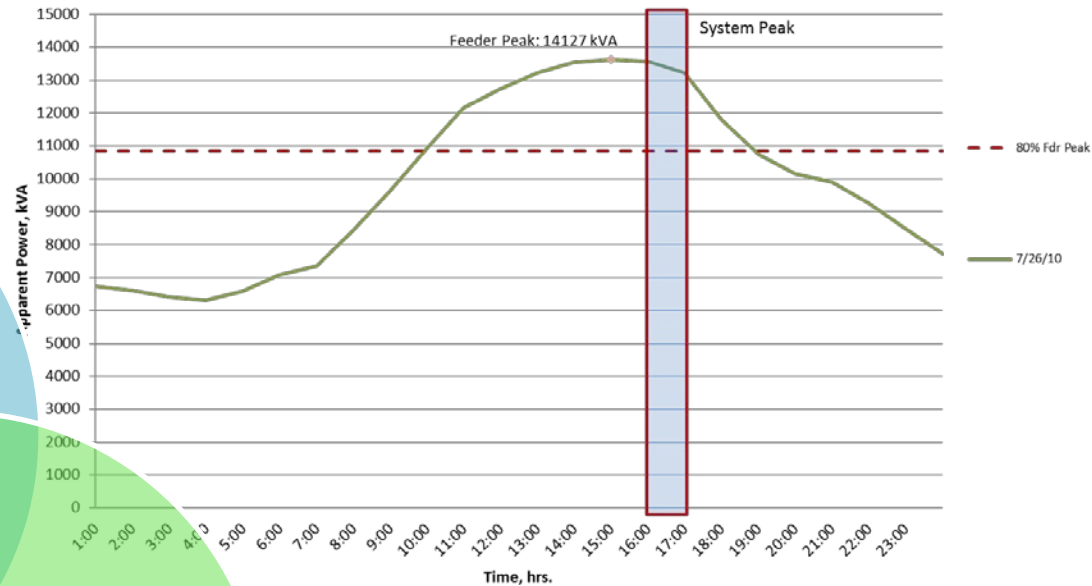
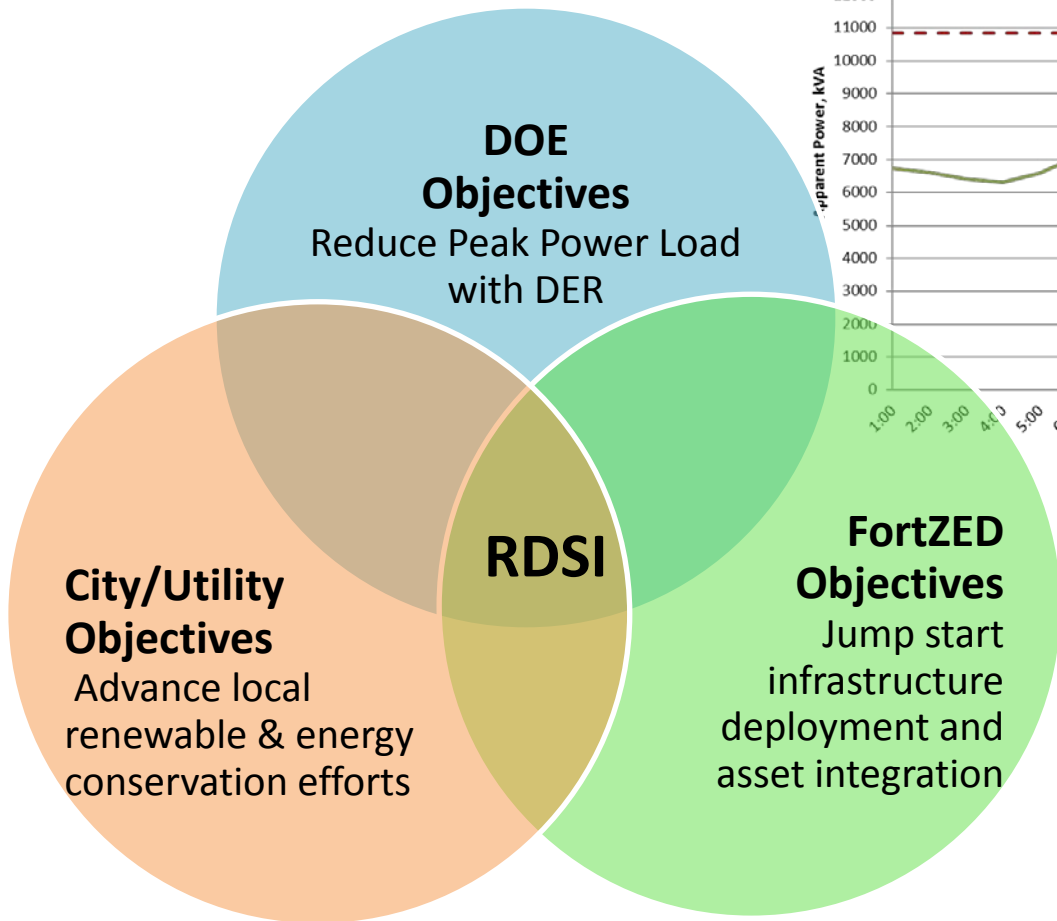
**Community: \$4,729,569**

**Total: \$11,052,949**

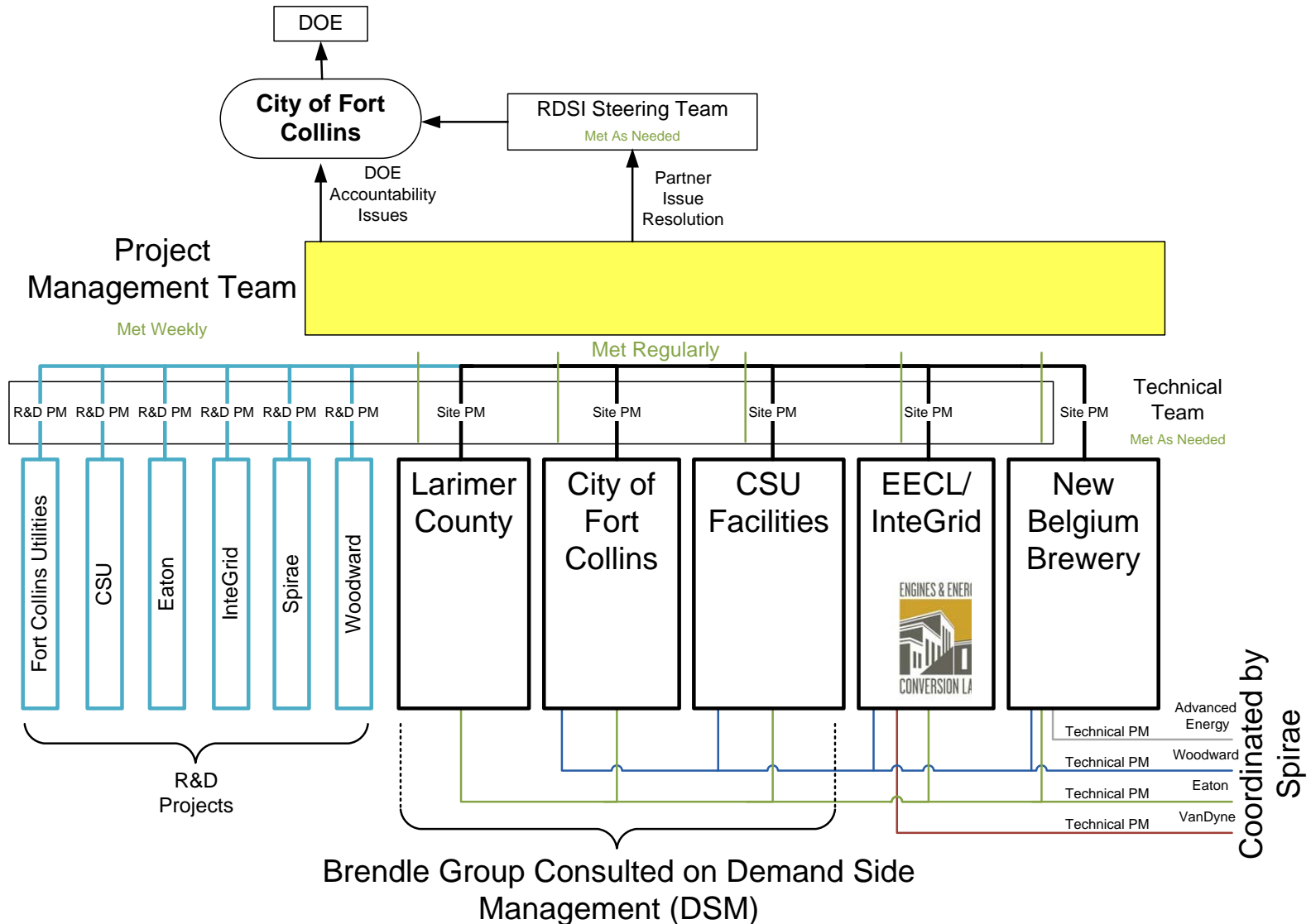
## Technical Scope

Integrate multiple and varied distributed energy resources (DER) from five partner sites with an active management platform that could coordinate the participation of these assets to achieve both project and community goals.

# Needs and Project Targets



# Interactions & Collaborations



# Technical Approach

1. Coordinated with technical and site partners to identify, upgrade, configure and/or install assets suitable for project participation
2. Deployed an active management platform that provides monitoring, data archiving and HMI services
3. Developed Peak Load Management (PLM) algorithm to manage assets to achieve specific project objectives within predefined constraints
4. Configured the system so that local control remains with site partners via their existing BAS or SCADA

# Technical Approach

spirae Menu **Asset Overview** Overview 

Total System Load	7940.90 kW
Control Setpoint	20000
Active Load Reduction	0.00 kW
Available Load Reduction	231.00 kW

Linden Substation 

Feeder 708

Feeder 722

Active Load Reduction	0.00 kW
Available Load Reduction	224.00 kW

Active Load Reduction	0.00 kW
Available Load Reduction	0.00 kW

Active Load Reduction	0.00 kW
Available Load Reduction	0.00 kW

Active Load Reduction	0.00 kW
Available Load Reduction	7.00 kW

Active Load Reduction	0.00 kW
Available Load Reduction	0.00 kW

City Hall

InteGrid

EECL

Go Live!

Re-Start

Stop

Record Run Data

Utility One line

Asset Overview

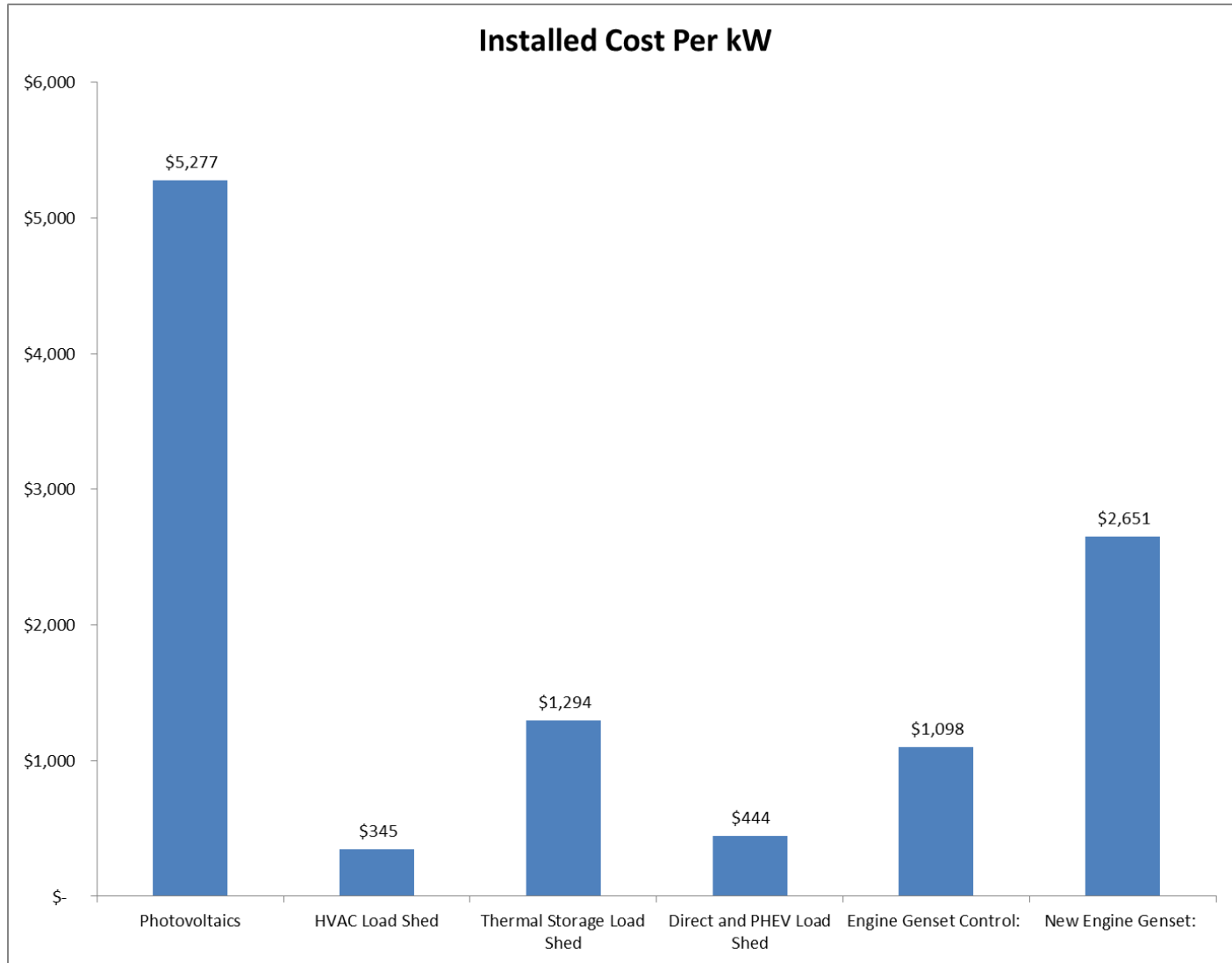
BlueFin Controller

Peak Load Manager

Run Started at 12-10-2011 10:35:13.259

Start  8:04 AM

# Technical Accomplishments



# Technical Accomplishments

## *Demonstration of 20% Feeder Peak Load Reduction on a Single feeder*

<u>Date</u>	<u>Load Reduction</u>	
2011-08-29	825 kW	15.5%
2011-08-30	1000 kW	20.0%
2011-08-31	1311 kW	28.7%
2011-09-01	1621 kW	34.8%
2011-09-02	–	–

## *Overall Asset Response Rate*

<u>Asset Class</u>	<u>Yes</u>	<u>No</u>	<u>Inconclusive</u>	<u>Response Rate</u>
Generation	139	3	9	92%–98%
Load Shedding	177	48	–	79%



# Technical Accomplishments

## *Capacity Requirements for 20% reduction during all of 2011*

Quarter	<u>Working Days</u>	<u>Days of Operation</u>	<u>Setpoint Fixed (kW)</u>	<u>Required Capacity (kW)</u>	<u>Control Duration (hrs)</u>	
					<u>Hrs/day</u>	<u>Total hrs</u>
Jan. - Mar.	62	4	11965	<b>227</b>	0.3	17.1
Apr. - Jun.	64	39	11965	<b>5484</b>	5.7	367.3
Jul. - Sep.	64	51	11965	<b>6241</b>	11.0	706.5
Oct. - Dec.	61	4	11965	<b>555</b>	2.5	153.0

# Lessons Learned

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- Regulatory and Commercial Considerations
- Interfacing, Communications, and Controls Details
- Unique Elements of Resources, Partner and Partner Site Details
- Adaptive load forecasting required

# Significance and Impact

- Demonstrated the use of a standardized controls platform to manage diverse DER assets
- Utilized standards-based communications protocols and security
- Significant partner and community participation and commitment
- Provides a foundation for future phases of FortZED
- Establishes a framework for economic commercial and residential participation (energy ecosystem)

# Contact Information

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# Back-up Slides

Include any back-up slides you would like to provide to the DOE program managers for additional information. The back-up slides will not be shared with others, unless specifically stated by the presenter.

## Estimated RDSI Demonstration Year Emissions Impacts

