



A Perspective On Innovative Solutions in the Test Bed

By
A Long Term, Utility-Scale Power Generation
Developer/Owner/Operator

Asia Pacific Clean Energy Summit and Expo

August 13, 2012



Eurus Energy America Corporation





Eurus Energy America



1. Who Are We?
2. Test Beds of Innovation
3. Developer/Owner/Operator Test Bed
4. Technological Innovations
5. Game-Changers?



Eurus Energy Group



- Eurus Energy Group is an experienced developer, owner and operator of utility scale renewable energy generation assets
- Goal is to own wind and solar power generation assets long term
- Active in wind energy generation since 1987 with over 2,100 MW of wind in operation globally
 - That means we have operating wind assets that are nearly 25 years old.
- Entered the solar energy business in 2008 with a MW scale PV facility in South Korea and more recently completed a 45 MW PV facility in California

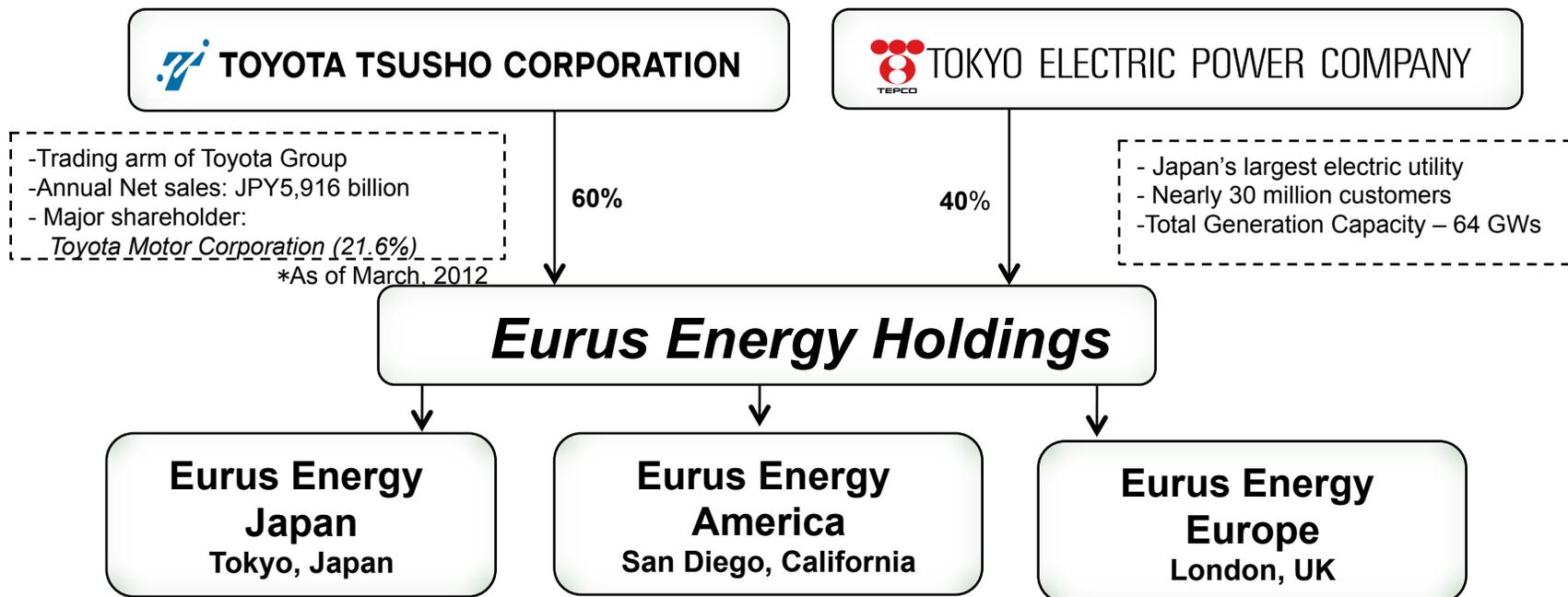


Eurus Energy Group



Jointly held by:

- Toyota Tsusho Corporation (Toyota Tsusho); and
- Tokyo Electric Power Company (TEPCO)

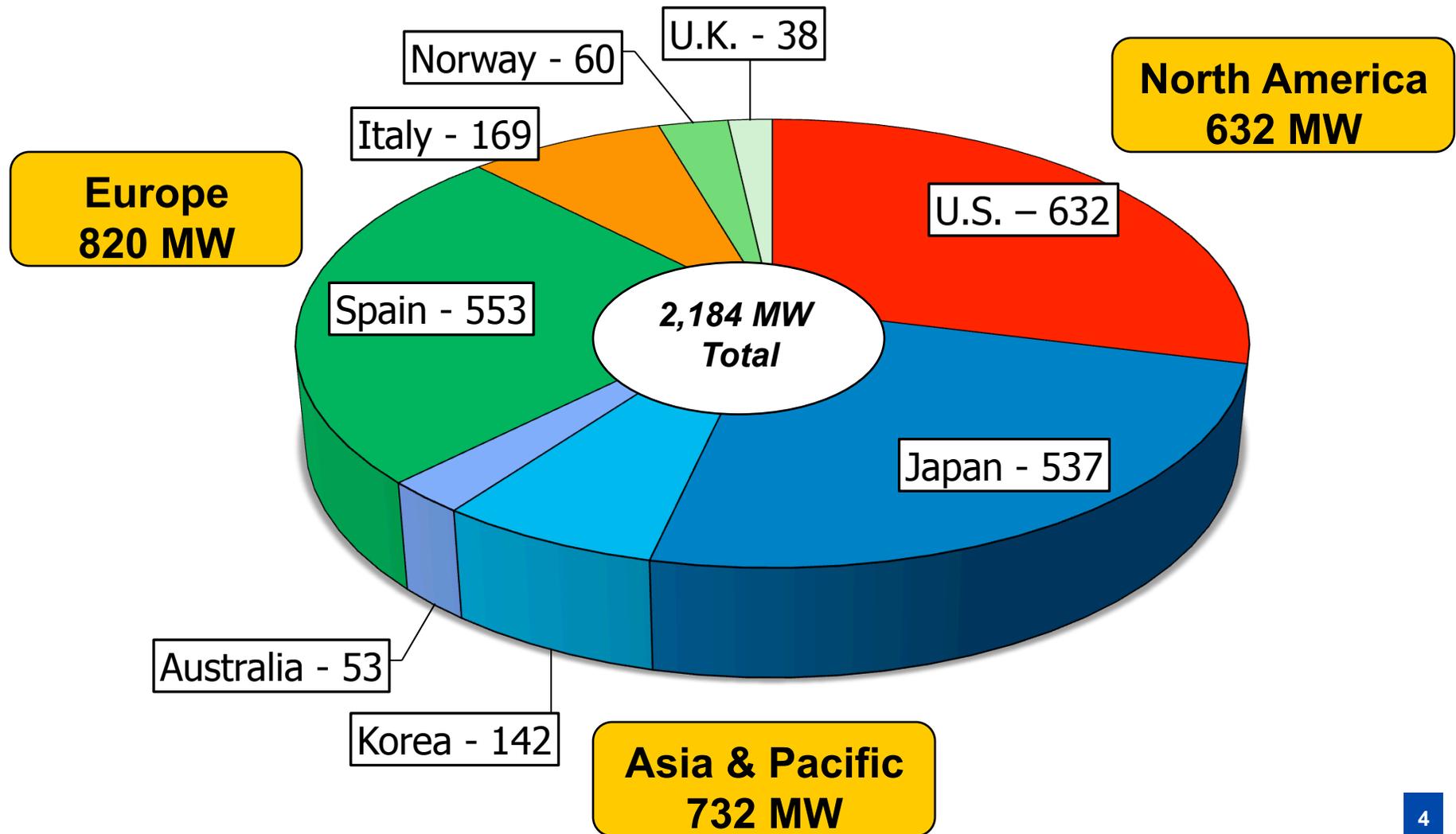




Eurus Energy Group



Total Renewable Megawatts Installed by Country as of August 2012

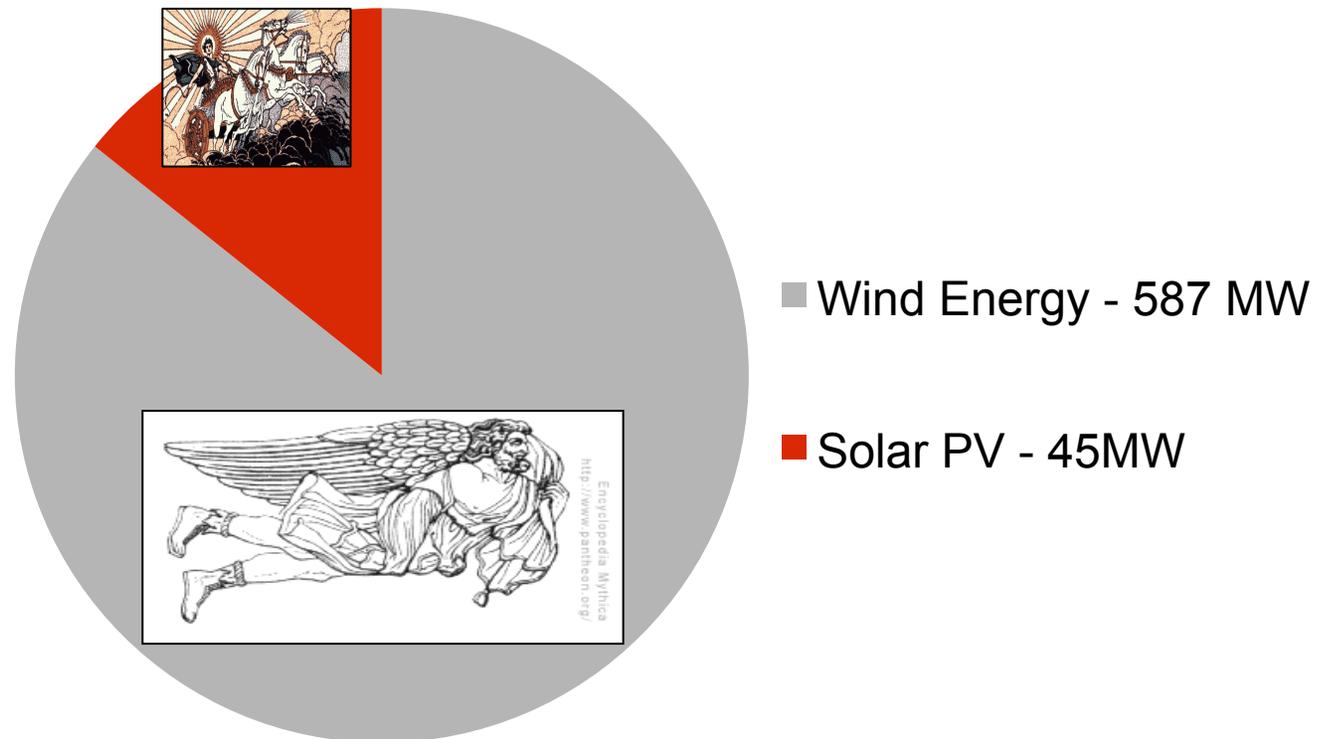




Eurus Energy America



North America Renewable Portfolio



- 632 MW of wind and solar assets in operation
- 1,500+ MW of wind and solar in development



Eurus Energy America



190 MW Mojave Desert Wind Power Plant (California)

- In operation since 1987



104 MW Combine Hills I & II Wind Power Plant (Oregon)

- In operation since 2003



60 MW Oasis Wind Power Plant (California)

- In operation since 2004



54.5 MW Crescent Ridge Wind Power Plant (Illinois)

- In operation since 2005

180 MW Bull Creek Wind Power Plant (Texas)

- In operation since 2009

45 MW Avenal Solar Power Plant (California)

- In operation since 2011



Eurus Energy America



1. Who Are We?
2. Test Beds of Innovation
3. Developer/Owner/Operator Test Bed
4. Technological Innovations
5. Game-Changers?



Test Beds of Innovation



Inventors

and

Innovators



Hawaiian Electric Company



- Innovators rely on existing inventions and ideas
- Innovators find ways to deploy them profitably to meet needs or wants
- Innovators also find ways to create those needs or wants
- Innovators don't need to be scientists or engineers
- Solutions today are complex and require multi-party coordinated action



Eurus Energy America



1. Who Are We?
2. Test Beds of Innovation
3. Developer/Owner/Operator Test Bed
4. Technological Innovations
5. Game-Changers?



D/O/O Test Bed



Problem-solving based innovation is critical for a developer/owner/operator. Here are some examples:

1. Reaching a transmission system
 - Developed, built and financed first privately owned multi-user transmission line in the U.S.
2. Securing Non-recourse project finance for a prototype 250kw wind turbine project in the mid 1980s
 - Developing appropriate warranty terms and parameters for wind forecasting confidence
3. Completing one of the first PTC tax-equity structured financings in the US in 2004
 - Finding a structure that met regulatory requirements while meeting the needs of the tax investor was key



D/O/O Test Bed



1. Securing Non-recourse project finance on first of kind PV project
 - Developing appropriate warranty terms was critical
2. Meeting permit requirements and vegetation management conditions
3. Minimizing project costs and construction time through effective logistics management
4. O&M – Minimizing costs / Maximizing performance





Eurus Energy America



1. Who Are We?
2. Test Beds of Innovation
3. Developer/Owner/Operator Test Bed
4. Technological Innovations
5. Game-Changers?



Technological Innovations



Eurus, our shareholders and affiliated companies are conducting R&D in the following areas which are of particularly significant importance for Japan:

- 1. Offshore Floating Wind Power**
- 2. Energy Storage**
- 3. Hybrid / Electric / Hydrogen Fuel Cell Hybrid Vehicles**
- 4. Smart Grid / Smart City / Energy Management Systems**

Unfortunately, I am not at liberty to comment specifically on those R&D efforts. But rest assured the Eurus Energy Group is looking to coordinate solutions necessary to bring these technologies to the utility scale power generation market



Hawaii will stand to benefit from advances in these areas.



Technological Innovations



At hand technological innovations that we as a developer/owner/operator would like to see:

1. Cost efficient ramp rate control by forecasting
2. Inverter/Power conditioner dual use for solar facilities
3. Comprehensive grid integration planning as opposed to individual project planning
4. Modular PV system
5. Improved SCADA systems and forensic analysis (ability to review millisecond data)
6. Automated “hotspot” information collection system for PV systems (drones?)
7. Automated PV panel washing systems
8. Improved PV ground mount racking systems and automation of construction
9. DC side batteries in PV facilities



Eurus Energy America



1. Who Are We?
2. Test Beds of Innovation
3. Developer/Owner/Operator Test Bed
4. Technological Innovations
5. Game-Changers?



Game-Changers?



Once again, innovations can come in many forms; financial, regulatory, technological. And most likely the innovation will be multi-faceted.

1. Global carbon tax
2. Time of day retail pricing
3. Compensation structure for energy storage
4. Comprehensive grid management with renewable and EV integration
5. Offshore floating wind
6. Ocean energy (wave, tidal and current)
7. Wireless transmission

But whatever it is, as a facilitator and innovator we will be working to get it to market.

