



LOW-COST, HIGH-PERFORMANCE HTS WIRE

ROCKET RENEWABLES, INC.

IEA EXCO MEETING

HEIDELBERG, GERMANY

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Chris Gronet | Brian Moeckly



Rocket Renewables

Mission

- **Produce the world's lowest cost, highest performance HTS wire**

Method

- **Combine proprietary HTS coated conductor process with reliable, highly productive equipment and world-class factory management.**



Company Timeline



October 2011:

- Incorporated
- Headquarters in Silicon Valley

End of 2012:

- Build equipment for pilot line, install R&D and metrology systems

2017: Ramp Complete

- 10,000 km/year output

April 2012:

- Seed Funding
- 20 employees

2013: Begin Production Ramp

- Ramp pilot line and ship samples to start qualification



Business Model

Ramp pilot line

- Produce enough supply of wire, enabling customers to qualify products
- Initial target applications: FCLs, cables, and transformers
- Pilot line will be automated and have the necessary factory control systems to allow rapid replication



License technology

- Enable partners with rapid expansion of high volume manufacturing
- Provide equipment and training to help ramp partners' wire production lines



Founding Team

Chris Gronet, President and CEO

- Ph.D. Semiconductor Processing, Stanford, 1988
- Founder, CEO G-Squared: RTP equipment, acquired by Applied Materials, ramped to \$1B
- Founder, CEO Solyndra: ramped solar technology from an idea to high volume mfg in 4 years

Brian Moeckly, CTO

- Ph.D. Physics, Cornell, 1994
- 17 years experience (Conductus, STI): superconductor film growth, properties, and applications

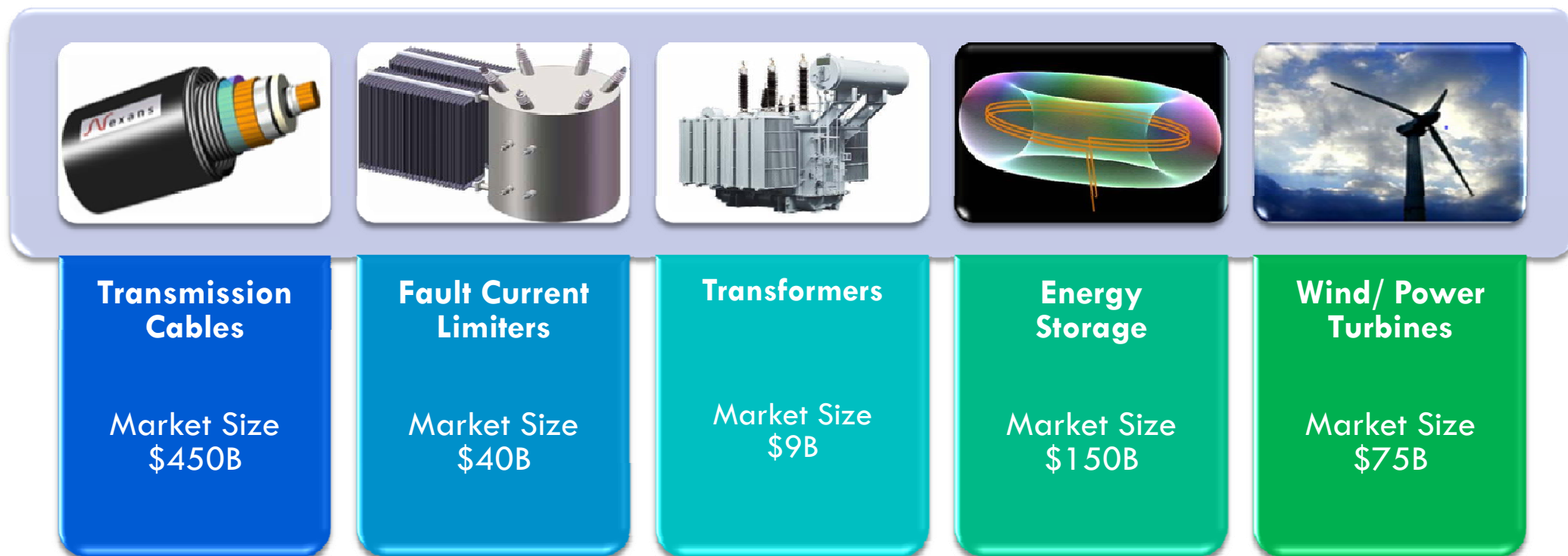
Bob Haggerty, CFO and VP of Business Operations

- 20 years in finance and ops including Applied Materials, Sun Microsystems, and Intel
- Managed finance and operations in 26 countries, established new operations in China

Dan Marohl, VP of Engineering

- 23 years experience designing thin film systems; over 25 patents
- Solyndra: designed the world's first reliable, high volume, thermal evaporation system

Target Applications



Total Market Opportunity: \$724B

Key assumptions: 30,000 substations worldwide, \$50/kA·m price of wire

Rocket Wire

Rocket Renewables Mission

- Produce the world's lowest cost, highest performance HTS wire

Rocket Wire Features:

- 2 km lengths
- <\$50/kA·m fully ramped
- $I_c > 500$ A/cm-width
- High I_c in magnetic field



Benefits:

- Enables applications for energy generation, transmission, storage, and grid stability improvement



Rocket Wire

RE-BCO Process

- Patent-pending evaporation equipment
- High quality, highly uniform film
- Capability for thicker layers
- Good performance in magnetic fields

Equipment

- High productivity – wide substrate, rapid line speed
- High reliability and uptime
- Uniform and repeatable for high I_c and long lengths

KEYS TO LOW COST AND HIGH PERFORMANCE

Process Control

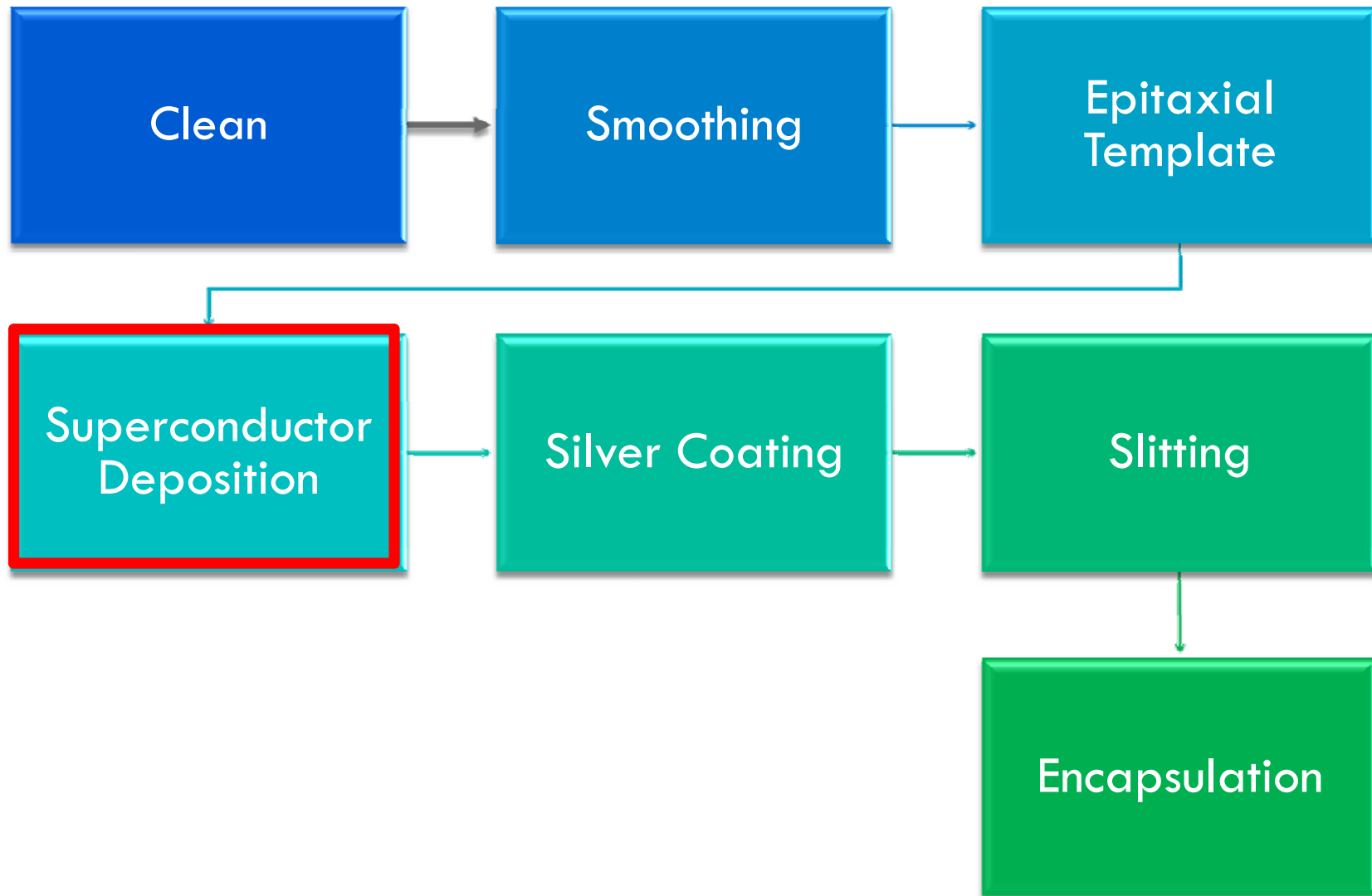
- In-line metrology
- *In situ* monitoring

Factory

- 24/7/365 operation
- FIS – factory information system for yield ramp and management
- MES – manufacturing execution system to optimize material flow and costs

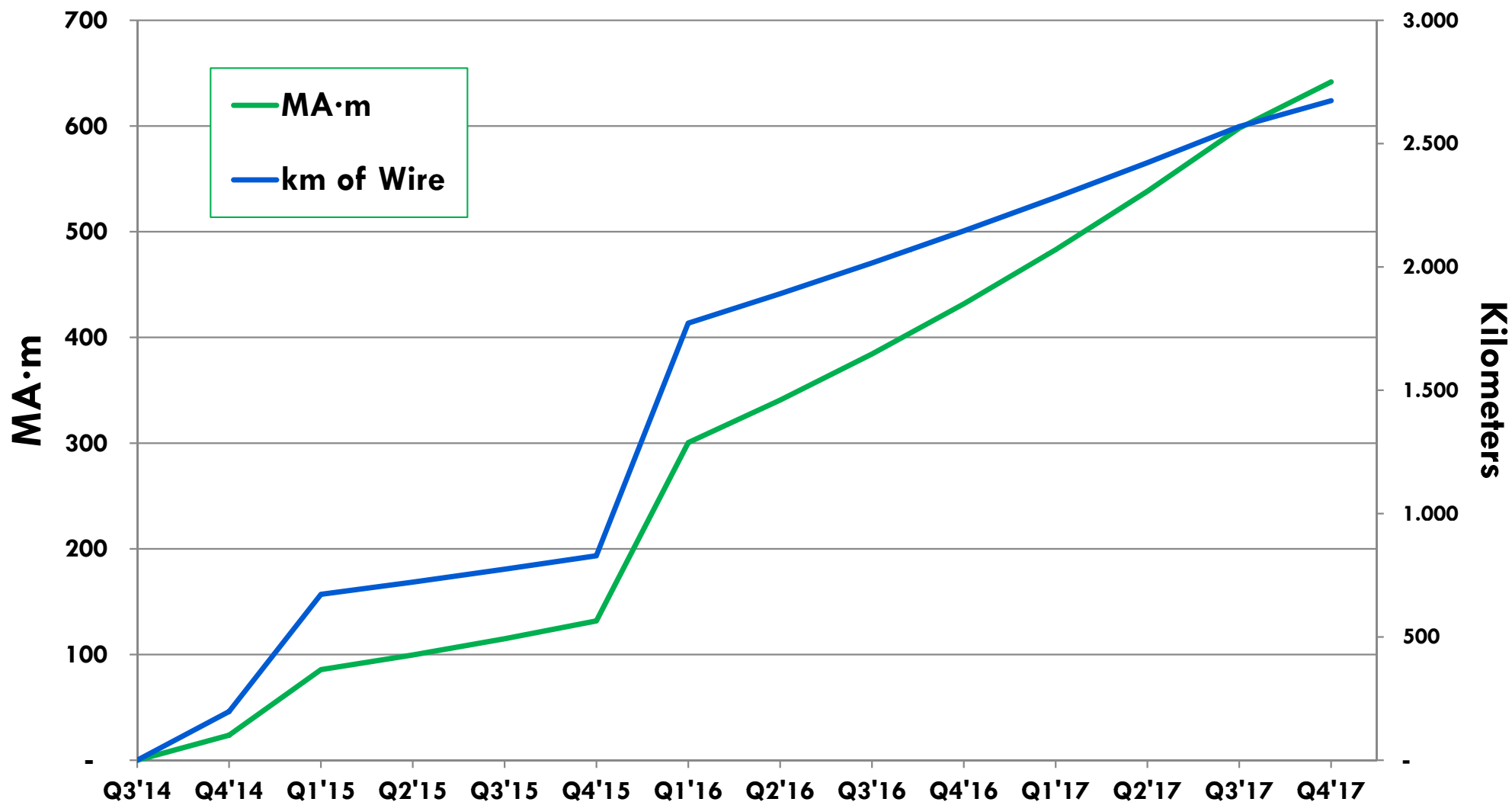


Process Flow





Pilot Line Output





Current Status

Pilot line model and financial model complete

- COGS details
- Stress and scenario testing

Seeking partners

- manufacturers of utility components

Detailing design of pilot line equipment

Fabricating test modules for key equipment

Fundraising