Munich Re - Green Tech Solutions
Growing profitable business while tackling climate change

Established Renewables
- Solar Energy
- Wind Energy

Smart Energy
- Electrical Energy Storage
- E-Mobility
- Air Conditioning/Heating
- Sustainability Improvements
- Energy Efficiency

Circular Economy
- Bio Energy/Waste to Energy
- Fuel Cells
- Decontamination
- Water Treatment
- Efficient Resource Extraction
Green Tech Solutions
Portfolio and Proof Points (as of end of 2019)

More than USD 1.5 bn exposure in support of over USD 20 bn capital in green technologies

- Internal expertise due to industry experts in-house
- Own test field at research center
- More than 180 PV manufacturers audited

Focus on Technology and Performance Risk

- Long term performance protection up to 25 years
- Additional triggers, e.g., Insolvency of the manufacturer

World-class partnerships with research and certification institutes, e.g., DEKRA, Fraunhofer, TÜV, VDE, …

Over 100 insured projects and manufacturers in 16 countries
15 GW insured

Icons: used under license from shutterstock.com
The future of energy generation
Renewable energy sources powering our daily lives

Market drivers and applications for EES

- Independence from conventional energy sources (fossil fuels, nuclear)
- Energy security & availability
- Climate goals and reduction of greenhouse gases

Market drivers

- On-Grid area
  - Renewable buffering

- Off-Grid area
  - Standalone solutions powered by electricity

Global energy storage market in 2040

- Power fluctuation (Grid quality)
- Frequency stabilization (Grid stability)
- Time shifting (Aligning power demand and supply)
- Electro-Mobility (EV, railways, other electric powertrain)

Global cumulative storage deployments

Source: BNEF 2019
For your next Request for Proposal (RFP)
Require an Investment Grade Warranty

- An Investment Grade Warranty brings down your cost of capital
- An Investment Grade Warranty ensures the long-term success of (the cash flow model) your project
- Good practice example:
  - **ESS Supplier** must provide a warranty for the proposed Energy Storage System for the project for at least 10 years of operation
    - Supplier to define key operating parameters in warranty, including, but not limited to capacity, efficiency, temperature, availability
    - Supplier to define operations and maintenance requirements for warranty compliance
  - **ESS Supplier** must have an Investment Grade credit rating, secure Investment Grade parental guarantee, or Warranty Insurance policy from an entity with a minimum credit rating of S&P BB-, Moody’s Baa3.
    - Parental Guarantee or Warranty Insurance term (in years) should be at least 10 years
    - Parental Guarantee or Warranty Insurance must provide for dedicated capacity for the Project assigned to Developer and transferable to future owners of the Project
Munich Re Green Tech Solutions

Warranty Parties involved and their relationship

- **Component Supplier(s)**
- **System Provider (Insured)**
- **System Owner (potential beneficiary)**

- Insured in case of System Provider’ insolvency = bankable project
Our Solution
Energy Storage System (ESS) Performance Warranty Cover

Description
Long-term product & performance cover for
- Battery Cells & Packs
- Stationary Energy Storage Systems
- E-Mobility Applications

Risk Transfer Solution
- Indemnification of excessive warranty claims
- One time premium based on insured year’s revenue
- Non-cancellable for the insurer

Achievements
- Increased predictability for financial reserving
- Boost of growth-relevant cash reserves for R&D/marketing
- Balance sheet protection

Value proposition
- Long-term security for manufacturer during multi-year liability period
- Add-on: insolvency protection for large investment projects

Corporate Cover
- “Qualified” Project A: Cover
- “Qualified” Project B: Cover
- “Rest of Production”: No Cover

Project Cover
- “Qualified” Project A: Cover
- “Qualified” Project B: Cover
- “Rest of Production”: No Cover

In case of Insolvency of the Manufacturer
- Cover for the Manufacturer
- Cover for the Project Owner in the Insolvency Case

Warranty Period
10 years
Required steps to finalize a tailor-made insurance solution

1. **Initial Risk Assessment/Review** (e.g., Product Sheets, Test Results, Certificated, Warranty)
2. **Case Study with insurance structure** (Project Underwriting Agreement)
3. **Site Visit & Additional Requirements** (e.g., BMS - check by Third Party, Additional Certificates/Tests)
4. **Non-Binding Indication** (Premium Rate)
5. **Contract Wording Alignment**
6. **Binding Offer**
7. **Contract signing**

- In-house technical experts
- Underwriting in Munich and in local branches
- Detailed Pricing Model and Scenario Analysis
Thank you very much for your attention!

Dr. Sebastian Scholz
Product Lead Smart Energy / Energy Storage

Tel. +49 89 3891- 8128
sescholz@munichre.com