

Innovative financial instruments to support energy efficiency

*“Opportunities and lessons learned from insurance
and other risk sharing mechanism businesses”*

Rubem Hofliger, Senior Client Manager for Latin America
Swiss Re Global Partnerships. Lima, 15-16 November, 2016

Swiss Re in the Weather & Energy Markets

Swiss Re is a **leading and highly diversified global reinsurer and corporate insurer**, founded in Zurich, Switzerland in 1863

Global presence, market leadership
Team of 50 Weather & Energy professionals globally

- AA- Rated
- Publicly traded
- Over 11,000 employees
- Global presence with 50 offices in over 20 countries

Environmental Commodity Markets (ECM)

- Largest weather protection provider in the world
- Weather protection business established in 1999
- Track record of product innovation
- Derivative carrier(s) doing business in most countries
- Licensed reinsurer in most countries

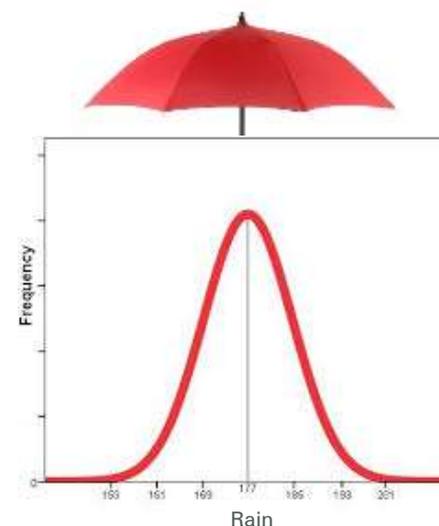


Weather Risk Solutions

- We offer tailor made solutions to transfer Weather Risk out of our clients' balance sheet. Main industries attended: energy, agriculture, construction and entertainment
 - Tailor made solutions to weather exposure
 - Cash flow, results and risk management solutions

Risks Covered

- Precipitation (rainfall, river flow, snow)
- Wind (speed - m/s)
- Temperature (°C)
- Solar Irradiation (Wh/m²)
- El Niño (ONI index)
- Commodity price exposure (Crude, Coal and Gas) contingent to weather

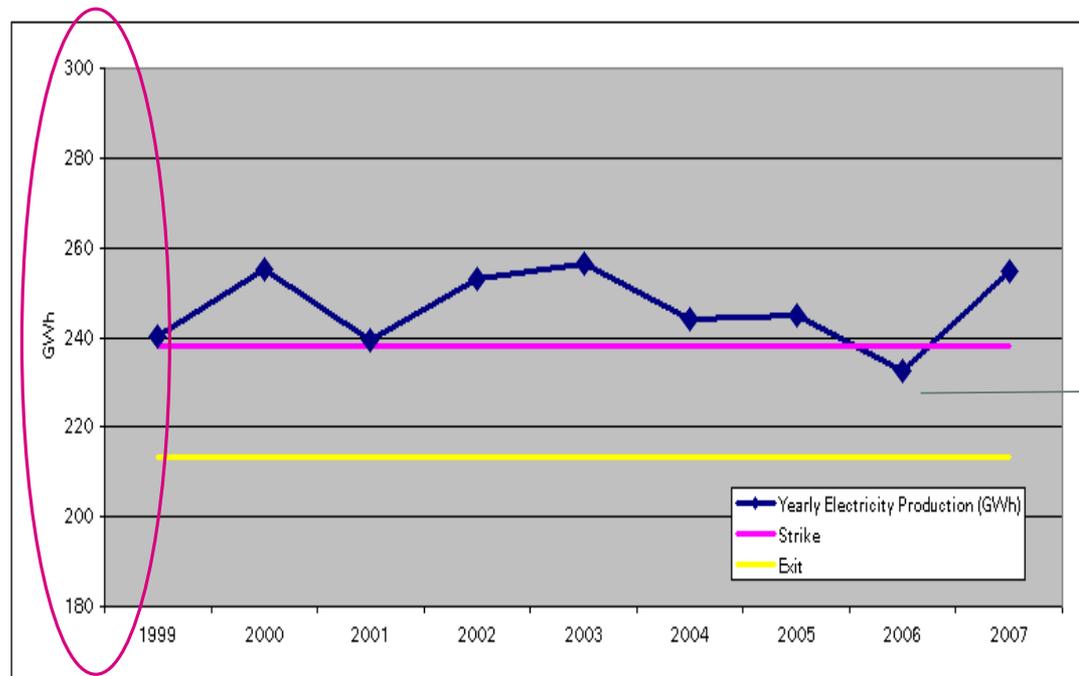


Renewable Energy Solutions

Hedging Wind Risk

What happens to energy with not enough or too much wind?

Insurer agrees to indemnify insured against “bad-wind” years by paying a contracted amount for every unit of shortfall below a specified floor



Trigger

Payment is denominated in power-equivalent units of windspeed measured by objective and transparent methodology



Low Solar Radiation Solution

Production Hedge

- **Issue:** Golden Concord Holdings (GCL) is China's largest non-state owned power producer. The company wanted protection against adverse weather (low solar radiation) for a plant in Northwest China.
- **Solution:** Swiss Re provided a hedging contract to compensate GCL in periods of low sunlight to mitigate lost power sales revenue
 - Weather index used to determine when payout is due
 - Based on third-party solar radiation data
 - Stable cash flows increase the certainty of investor returns

Example Radiation Adjustment

Month	Monthly adjustment factor
1	1.9575
2	1.6006
3	1.2565
4	1.0643
5	0.9531
6	0.9083
7	0.9286
8	1.0204
9	1.1983
10	1.4693
11	1.8092
12	1.9726

Product Overview Example

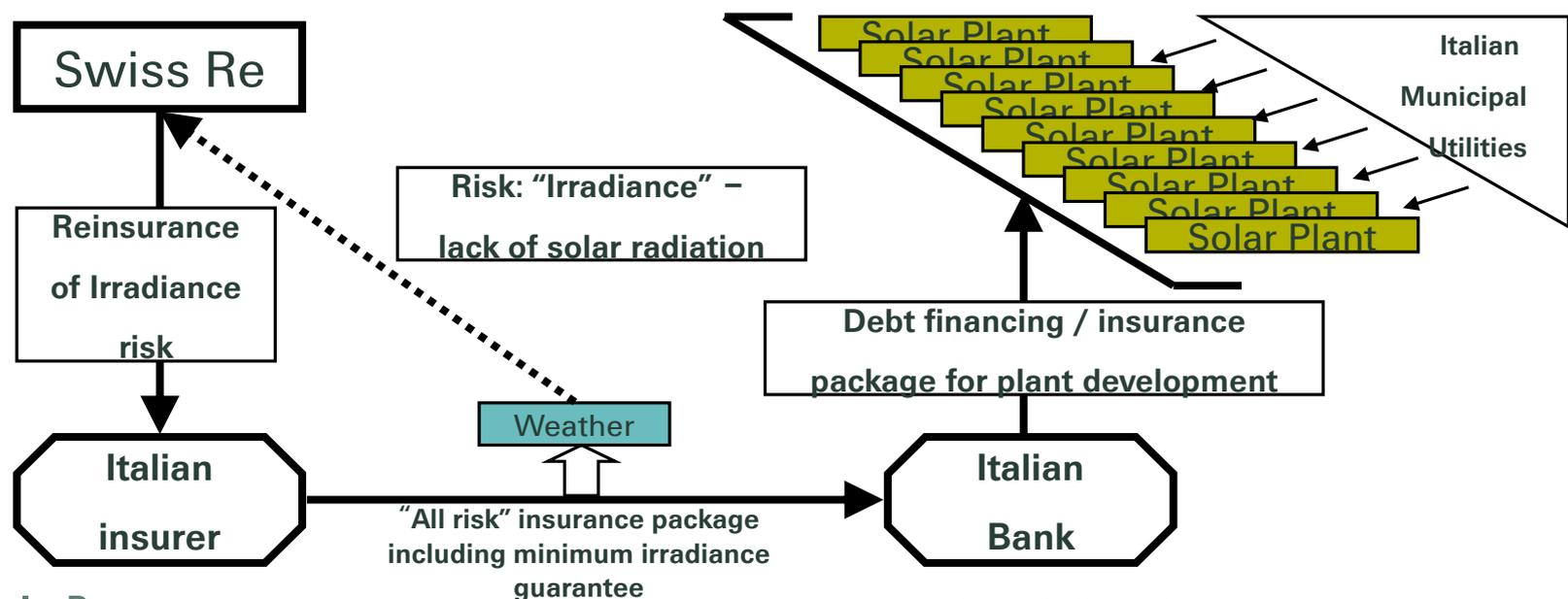
- Solar Production Hedge
- Size: 50MW
- Term: 1 year
- Strike: 79,000 MWh
- Power Price: \$85/MWh
- Limit: \$1M

Solar Index Example Calculation

Monthly Solar Radiation x Installed Capacity x
Adjustment Factor x Performance Factor

Insuring Italian Sunshine

- An Italian client approached us with request for weather protection as part of an all-risk insurance package
- Ultimate client is Italian bank, as promoter and debt provider for Italy's subsidized solar energy program
- Structure had to address challenging price target, small transaction size and unclear client objectives
- Negotiation led to 5-year "recovery" structure



Solar Impulse completes the Round-the-World flight!



On 26 July 2016 Bertrand Piccard, André Borschberg and Solar Impulse 2 (Si2) completed the first Round-the-World (RTW) solar flight **without a drop of fuel**, proving that clean technologies can achieve the impossible.

This 17-leg journey took 21 days of flight time and covered over 43,000 km as Si2 crossed Asia, the Pacific Ocean, the USA, the Atlantic Ocean, the Mediterranean Sea and the Middle East.

During the pioneering flight, Solar Impulse set 19 world records, including André Borschberg's particularly memorable Pacific crossing, which lasted for five consecutive days and nights.

Swiss Re Corporate Solutions has been part of the Solar Impulse adventure since 2012 as its official partner and sole insurance provider.

<http://www.solarimpulse.com/>

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