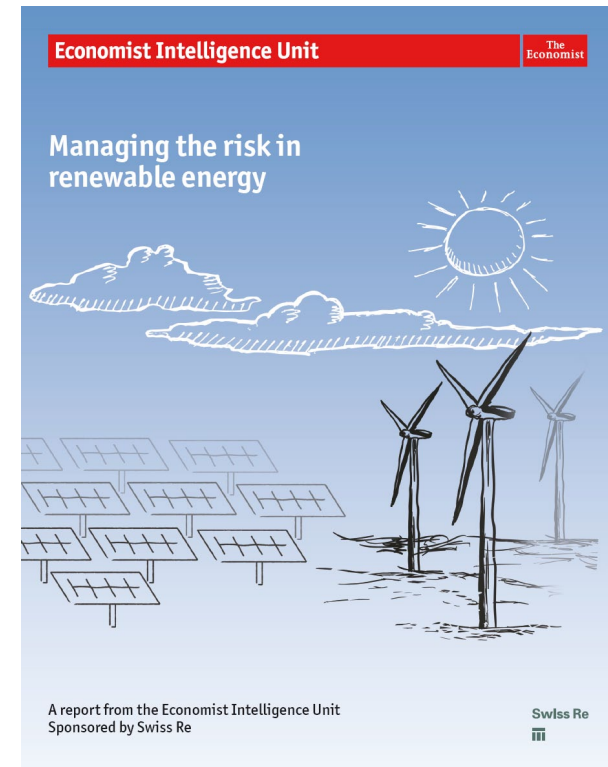


Managing the risk in renewable energy

A research report from the Economist Intelligence Unit
Sponsored by Swiss Re

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Background/Research objectives

- **Rising investment:** In 2010, for the first time, global investment in new renewable energy projects exceeded investment in new fossil fuel-fired plants.
- **Rising risks:** As investment grows, so do the risks of financing, building and operating renewable energy plants.

Research objectives:

- ❖ Gauge importance of renewable fuels to power-industry players
- ❖ Identify main types of risk facing operators, financiers and others
- ❖ Determine degree of awareness of those risks
- ❖ Compare awareness to actual incidence of risk events
- ❖ Examine ways companies mitigate and transfer risks
- ❖ Assess adequacy of risk management resources available



About the research: Overview

The research had three main components:

- Desk research
- Online Survey
- In-depth interviews



About the research: Online survey

- ❖ Survey of 284 energy and finance executives in July/August 2011
 - **Targeted regional focus:** Companies headquartered in Western Europe (50%), USA (38%), Australia (12%); **European respondents** roughly evenly divided among Germany, UK, Denmark, Spain, Italy
 - **All active in renewable energy** as plant operators (37%), designers/builders (21%), power distributors/sellers (20%), or plant financiers/investors (18%)
 - **Renewable fuels focus on** wind (27%), hydropower (26%), bioenergy (24%), solar (15%), geothermal (4%)
 - **High level:** Nearly half (48%) C-level executives or above
 - **Both large and small:** 52% represent companies with more than US\$500m in global annual revenue
 - **Relevant experience:** Respondents typically are in operations/production, strategy and business development, or general management

About the research: In-depth interviews

❖ In-depth interviews with 15 senior renewable energy executives and other industry experts from the following organisations:

- **3TIER** (US)
- **8KU Renewables** (Germany)
- **Alpha Ventus** (Germany)
- **Altran** (Germany)
- **Enel Green Power** (Italy)
- **Eraring Energy** (Australia)
- **European Wind Energy Association** (Belgium)
- **Global Energy Efficiency and Renewable Energy Fund** (Luxembourg)
- **Gowling Lafleur Henderson** (Canada)
- **International Finance Corporation** (US)
- **JLT Specialty** (UK)
- **Pacific Hydro** (Australia)
- **RWE Innogy** (Germany)
- **SUSI Partners Sustainable Investments** (Switzerland)
- **TRUenergy** (Australia)



About the research: Eight types of risk identified

The survey examined eight main types of risk associated with financing, designing, building and operating renewable energy plants:

- **Financial risk** (access to capital)
- **Business/strategic risk** (technological obsolescence)
- **Building and testing risks** (unproven technology, natural hazards)
- **Operational risk** (plant closure due to plant damage/component failure)
- **Environmental risk** (liability for environmental damage)
- **Political/regulatory risk** (change in public policy affecting profitability)
- **Market risk** (increase in commodity prices or decrease in power prices)
- **Weather-related volume risk** (lack of wind or sunshine)



Key findings: Overview

1. Renewable energy is growing in strategic significance in the power industry, and is the focus of ever-**larger investments**.
2. As renewable energy projects grow in number, scale and complexity, the industry faces a **growing range of risks**—as well as significant **challenges** in managing them.
3. Plant financiers and operators consider **financial** risks the most significant, particularly in **early** project stages.
4. Industry players are becoming more **cautious**, taking a variety of measures to reduce their exposures and transfer the remaining ones. One emerging way to manage certain risks is to **diversify** by geography and by technology.
5. By a wide margin, the industry chooses insurance to transfer **financial risks** to third parties, followed by capital-market instruments such as catastrophe bonds.
6. For **operational risks**, industry players seem unsure whether to continue using current risk transfer mechanisms, which focus on insurance and capital-market instruments. Many transfer operational risks to hardware suppliers.
7. Confusion abounds on how best to manage **weather-related volume risks**. The industry calls for a broader range of risk transfer products to cover such risks.

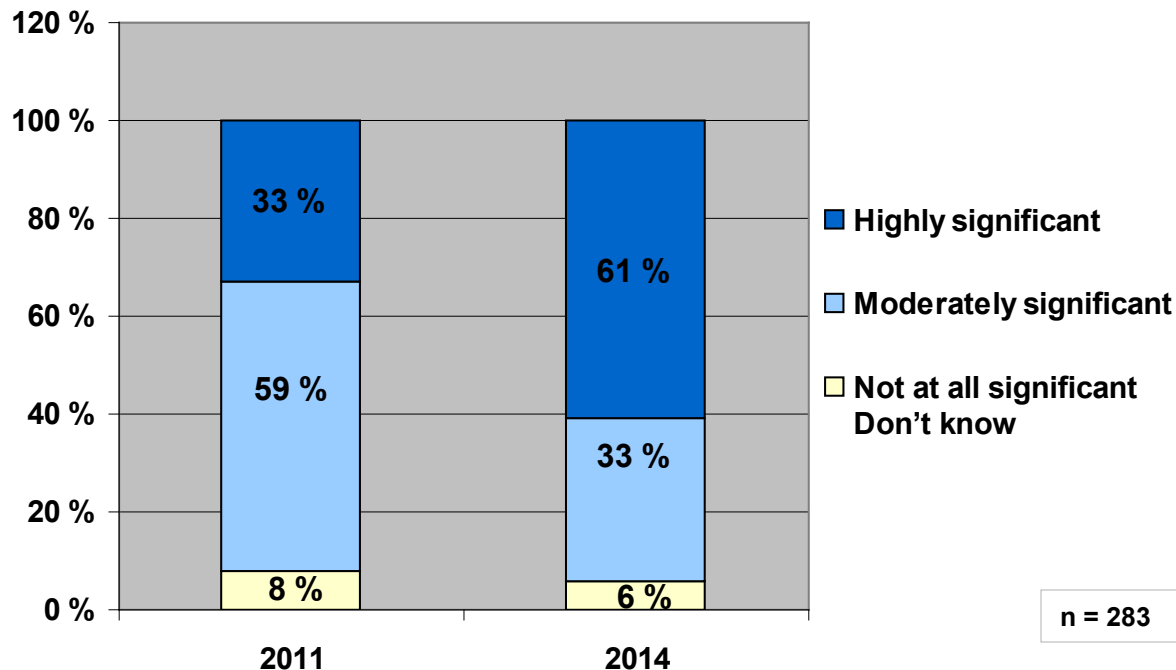


Key finding 1: Growing strategic significance, soaring investment

- Currently, renewable energy is rated as “highly significant” for business strategy in **33%** of firms surveyed...

... and by 2014, that proportion grows to **61%**.

How significant is renewable energy to your company's overall business strategy today, and how significant do you expect it to be in the coming three years?



- **Big spenders:** Almost half (46%) expect annual growth in their companies' renewable energy investments to exceed 15%. As investment rises, projects grow in scale and complexity.

Key finding 2: High risk awareness, middling response

The sector faces significant challenges in managing its risks

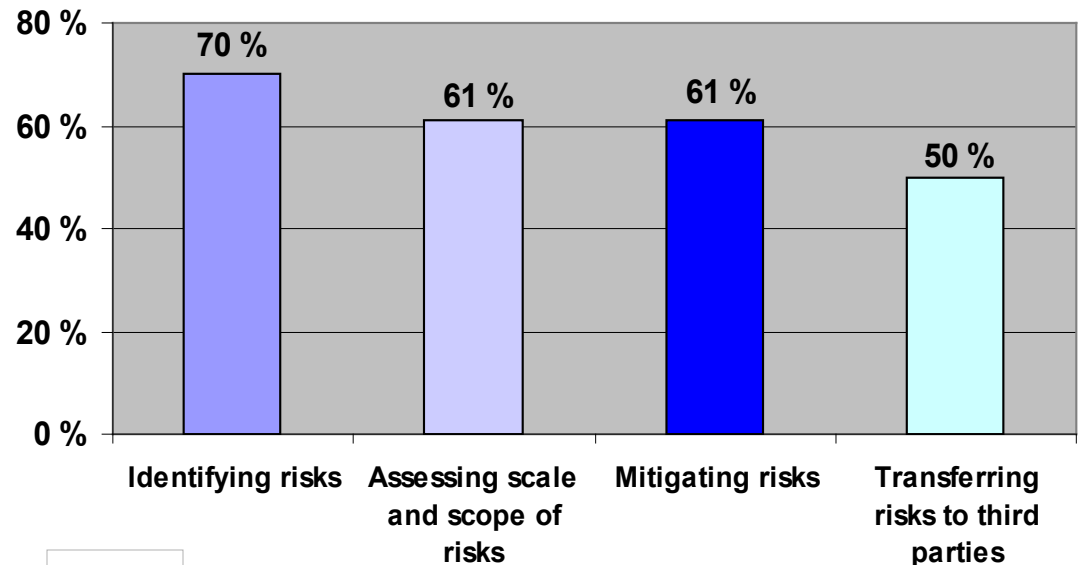
- **70%** of respondents say they are successful in identifying risks...

...but fewer say they are successful at transferring risks (**50%**)



In your view, how successful is your company at the following aspects of managing risks related to its renewable energy projects?

'Highly or somewhat successful'



n = 284

Key finding 2, continued

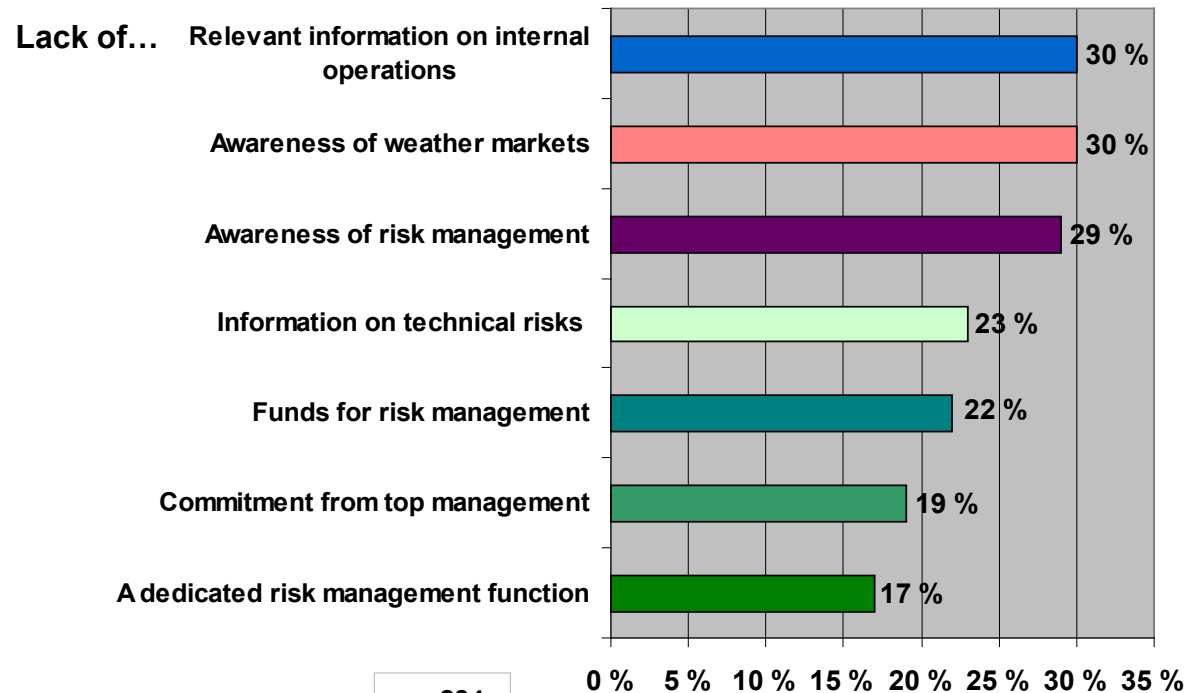
So why the middling response?

- Obstacles to more effective risk management include restricted availability of **industry data** and of suitable **risk transfer mechanisms**.



What are the three most significant barriers to more effective management of risks linked to your renewable energy plants?

[Top-scoring choices shown, taken from the original selection of 10 options]



Key finding 3: Risky business: financing plans

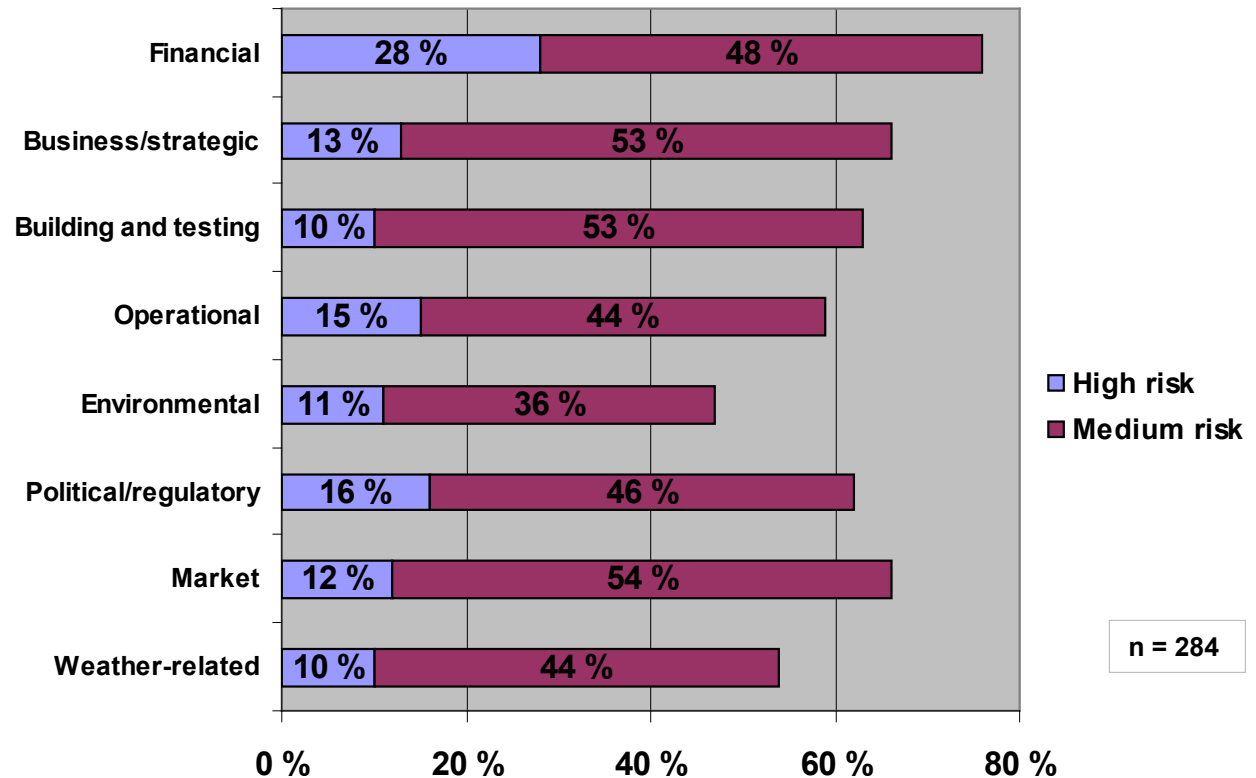
Financial risks are considered the most significant, particularly in early project stages

“The earlier you are, the more risk is associated with the project. ... It might be three or four years before you’re ready to operate.”

Thomas J Timmins
Leader, Renewable Energy,
Gowling Lafleur Henderson



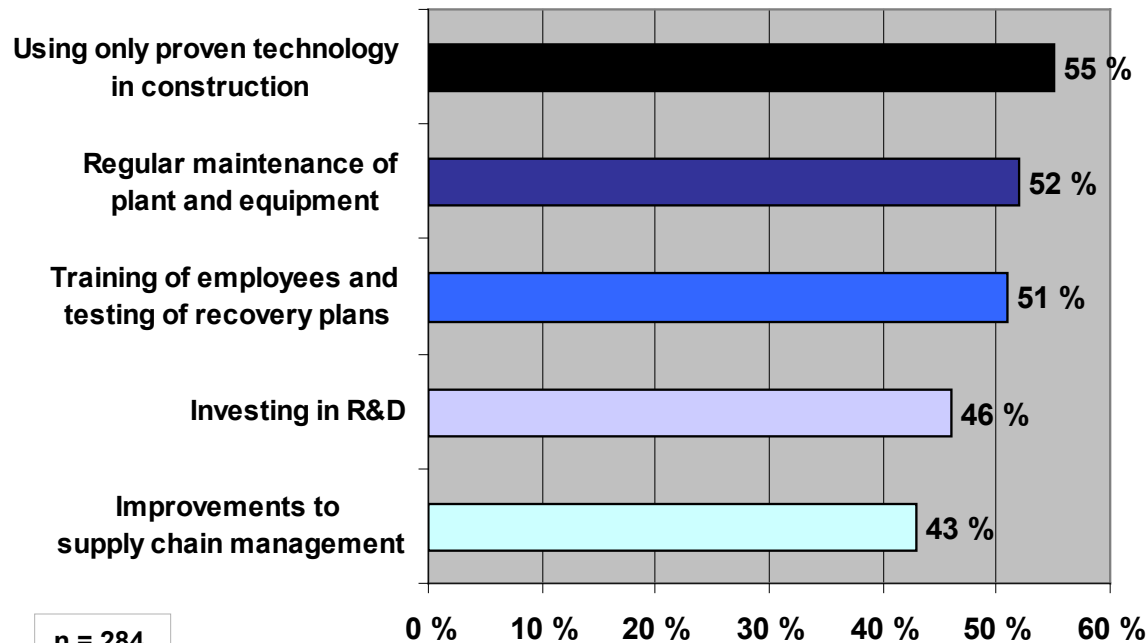
How would you rate the significance of each of the following types of risk to your renewable energy projects?



Key finding 4: Proceeding cautiously, diversifying where possible

A) Reducing construction and operational risks

What measures does your company take to mitigate business/strategic, operational and construction risks associated with renewable energy plants? Select all that apply.



n = 284

“Project developers usually don’t want to take technology risks. They want to have a technology that has been around for at least five years—established technology from Germany and Switzerland.”

Dr. Gunter Fischer, Principal Officer,
Global Energy Efficiency and
Renewable Energy Fund

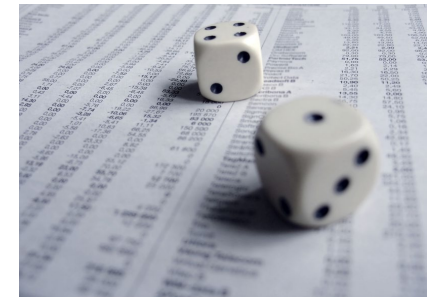
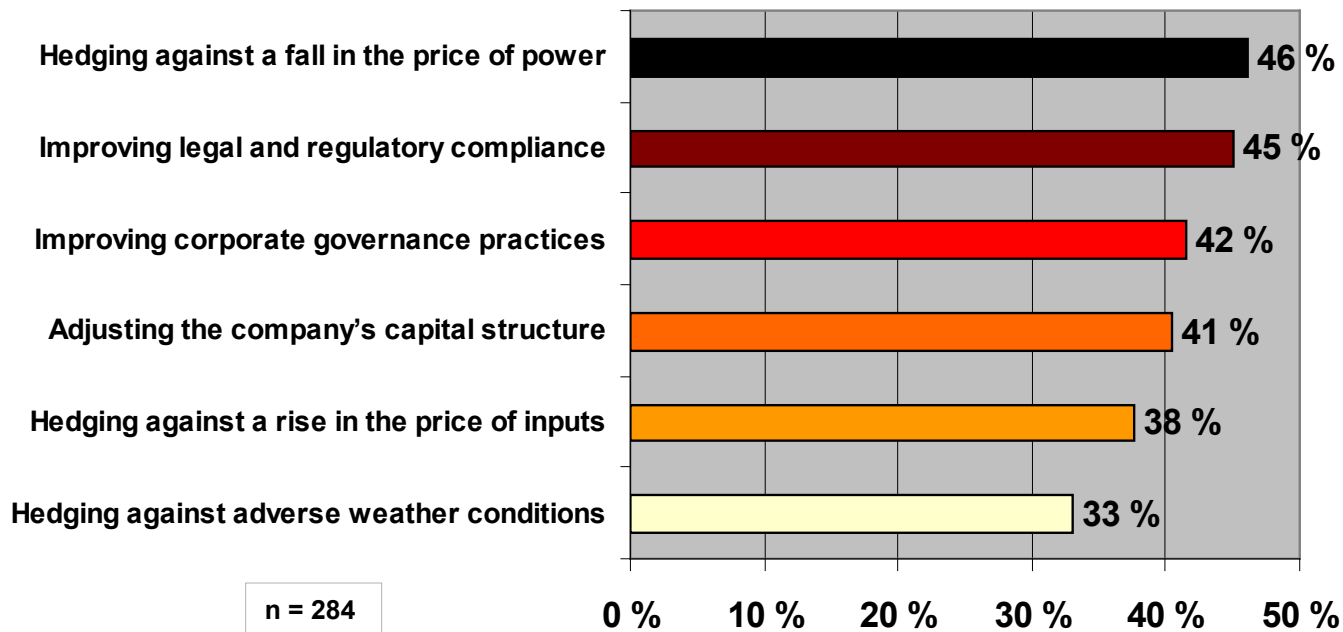


Key finding 4, continued

B) Reducing financial and market risks

What measures does your company take to mitigate financial and market risks associated with renewable energy plants?

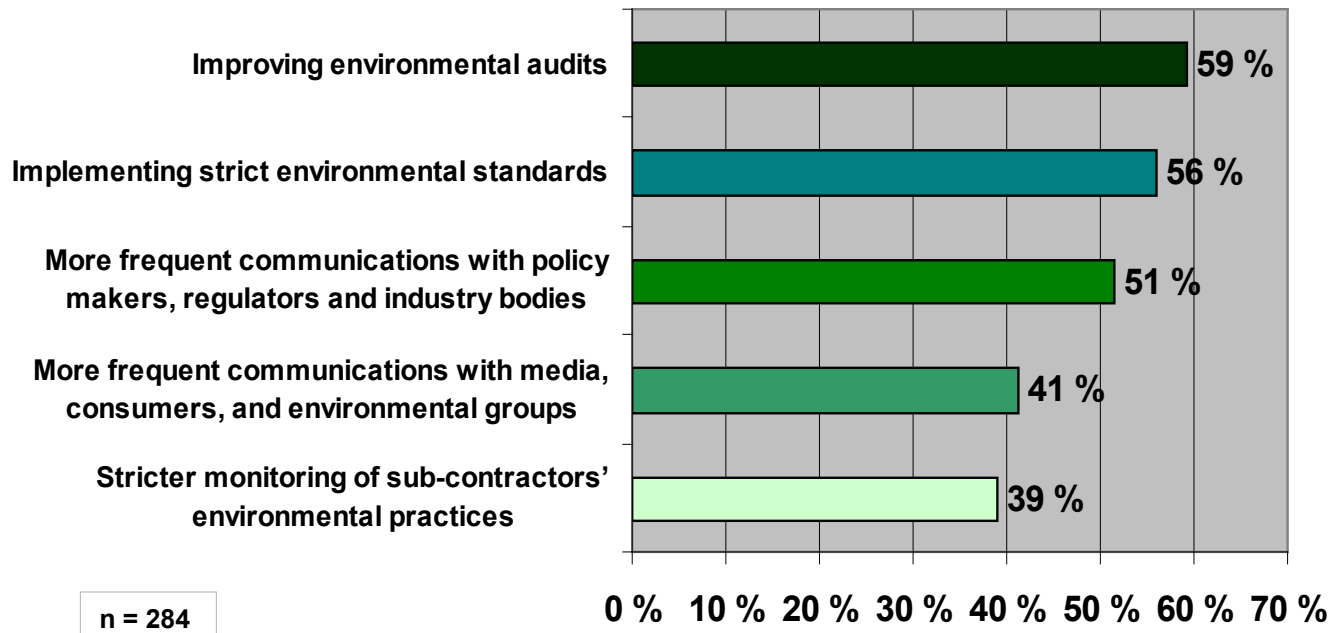
Select all that apply.



Key finding 4, continued

C) Reducing environmental, political and regulatory risks

What measures does your company take to mitigate environmental and political/regulatory risks associated with renewable energy plants? Select all that apply.



- In interviews, several industry executives pointed to **diversification** across geographies and technologies as the single most powerful tool to reduce **regulatory** risk and **weather-related** volume risk.



Key finding 5: Transferring financial risk: Insurance leads the pack

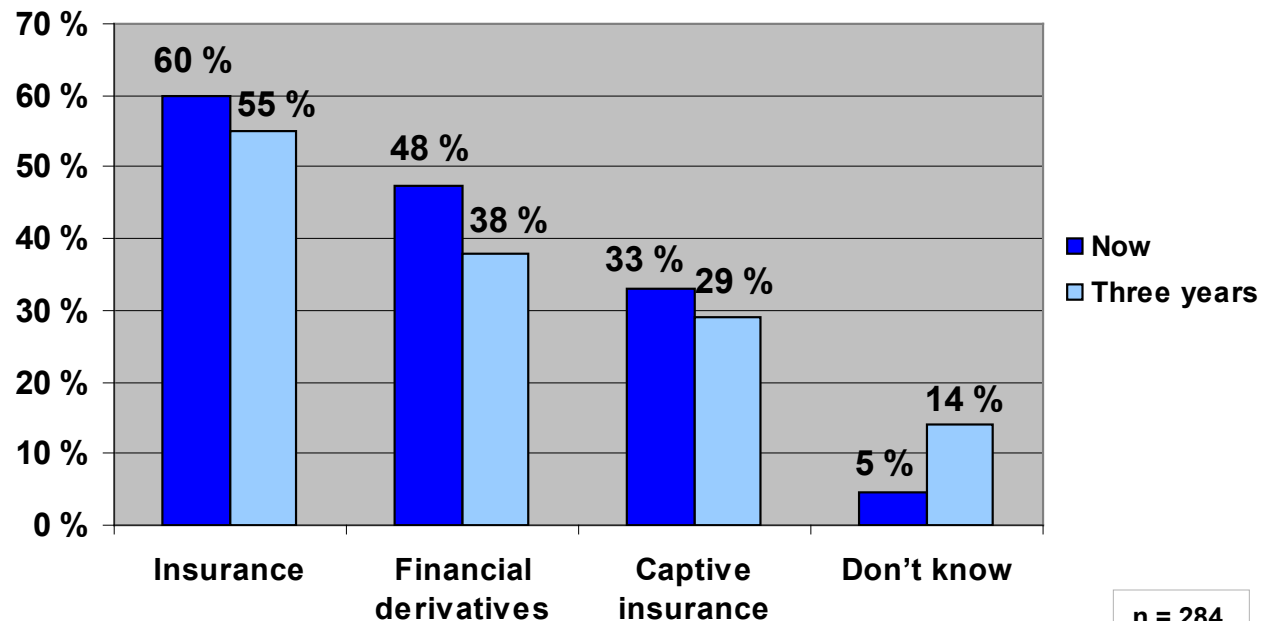
... but less reliance on today's methods expected in 2014

“You have to think about the value of stable income, and the value of low volatility of earnings. What does it mean for your balance sheet?”

Tobias Reichmuth
CEO and co-founder, SUSI
Partners Sustainable Investments



Which risk transfer mechanisms are you *currently* using for **financial risk** in renewable energy projects, and which *additional* mechanisms do you expect to use in three years?
Select all that apply.



n = 284

Key finding 6: Transferring operational risks: changes ahead

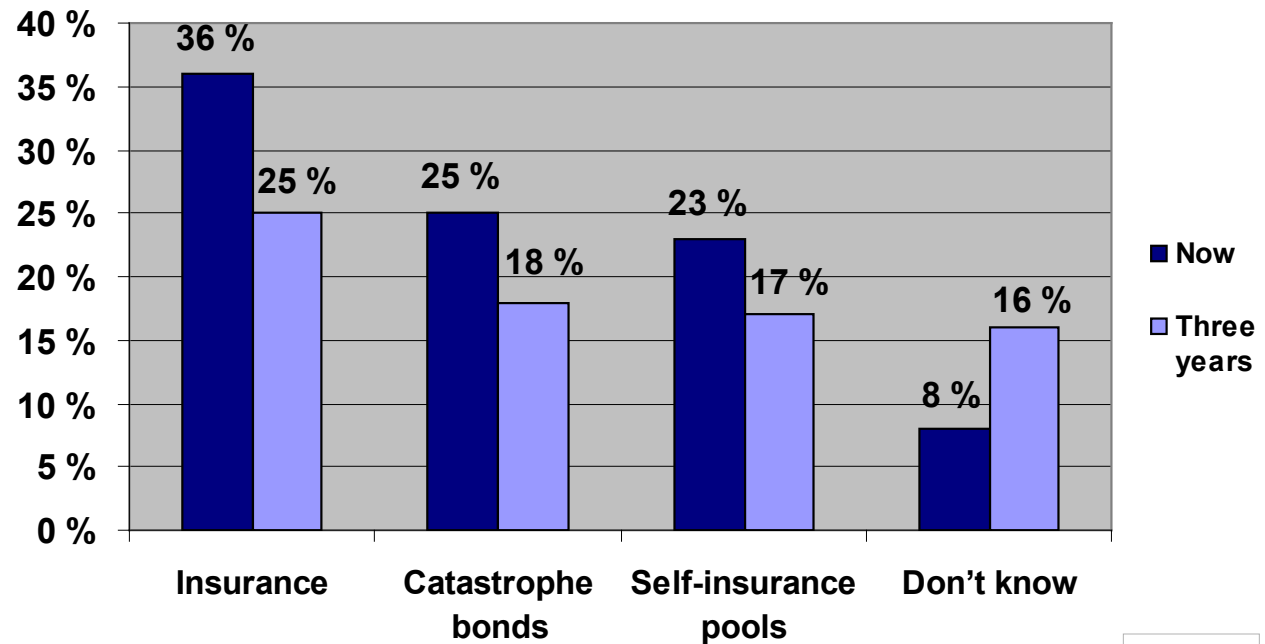
Operational risks: Insurance preferred today



In Interviews, several executives pointed toward transferring operational risks via contracts with hardware and components suppliers.

Which risk transfer mechanisms are you *currently* using for **operational risk** in renewable energy projects, and which *additional* mechanisms do you expect to use in three years?

Select all that apply.



n = 284

Key finding 7: Transferring weather risk: Cloudy outlook

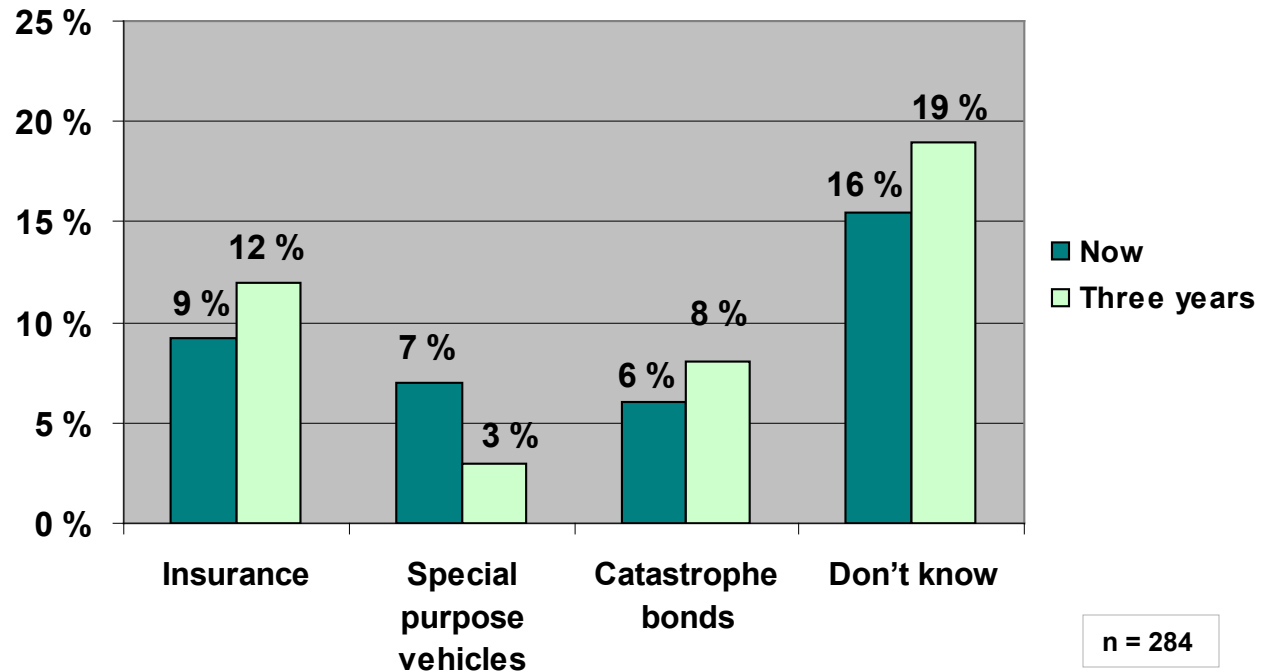
Few cost-effective alternatives seen; much of the risk retained



“The global growth in the renewable energy area will lead to more advanced and customised tools to hedge several kinds of risks.”

-- Eugenio Montrucchio,
Head of Risk Control,
Enel Green Power

Which risk transfer mechanisms are you *currently* using for **weather-related risk** in renewable energy projects, and which *additional* mechanisms do you expect to use in three years?
Select all that apply.



Conclusions

- **Power companies increasingly view renewable energy as central to their business strategies, and are developing larger and more complex renewable energy projects.**
- **Yet financial, political and regulatory risks remain high, particularly in a time of debt crisis and slow growth.**
- **While power producers use a variety of tools to transfer financing, operating and other risks, they require a broader array of risk-transfer mechanisms and more standardised ones.**



Recommendations

The insights of our interviewees and survey respondents point towards a number of recommendations for energy companies:

- **Intensify efforts to reduce and mitigate risk**—by sharing risk with joint-venture partners, or by investing in late-stage developments, for example.
- **Deepen industry collaboration to mitigate risk**—e.g., with pooling of maintenance equipment, and joint collection of relevant weather data.
- **Foster industry expertise and product development**—including comprehensive information and data on renewable energy technologies, and industry education programmes.

Thank you!

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