Innovest

Strategic Value Advisors, Inc.

Value at Risk?

An Overview of the Financial Implications of Global Climate Change

GERMANWATCH, Cologne, November 2002

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Company Overview

Equity Research

– Specialist equity research provider that caters to both socially responsible and mainstream investment markets
– Innovest Strategic Value Advisors was founded in 1995 and is headquartered in New York, USA

Products & Services

– EV'21® Company Report – Assessment & rating of environmental performance
– IVA® Company Report – Assessment & rating of social performance
– Sector Reports – Cover key intangible industry factors
– Sub Advisory Management – Product development with strategic clients

Coverage

– 1,700 global stocks across all sectors, comprising:

- S&P 500
- FTSE 350
- EUROTOP 300
- 200 Asia-Pacific stocks

Innovest's Recent Carbon Finance work

- **'Value At Risk'** (with CERES) **-** April 2002
  - **Fiduciary Duty and the implications of climate change at sector level**
- **UNEP Finance Initiative -** July 2002
  - **Understanding the relevance of climate change to the financial services industry and charting a course for action**
- **Carbon Disclosure Project** - ongoing
  - **Institutional investors targeting global Fortune 500 on climate risks and management responses**
  - Innovest Strategic Value Advisors **to process results and compile report**

Climate Change: Risks and Opportunities for Companies

Climate Change: the Scientific Evidence

- **Estimated temperature increases over next century:**
  - **1.8-5.4°F - wider use of clean fuels**
  - **6.3-13.5°F - 'business as usual' case**

- **Potential effects:**
  - **Reduced lake levels and outflows & reduced water quality**
  - **Changes in the frequency, intensity, and duration of heavy precipitation events**
  - **Changes in the nature and extent of “disturbance factors” - forest fire, disease/pest outbreaks, floods, etc.**
  - **Potential loss of specific ecosystem types**
  - **Altered food production dynamics**
  - **Increased frequency and severity of heat waves**
  - **“discontinuity scenarios”**

Risks to Companies & Shareholder Value

2 main sources of risk:

- Economic & competitive risks from climate change itself (e.g., weather-related effects)

- Exposure to the regulatory and competitive implications of attempts to mitigate GHG emissions

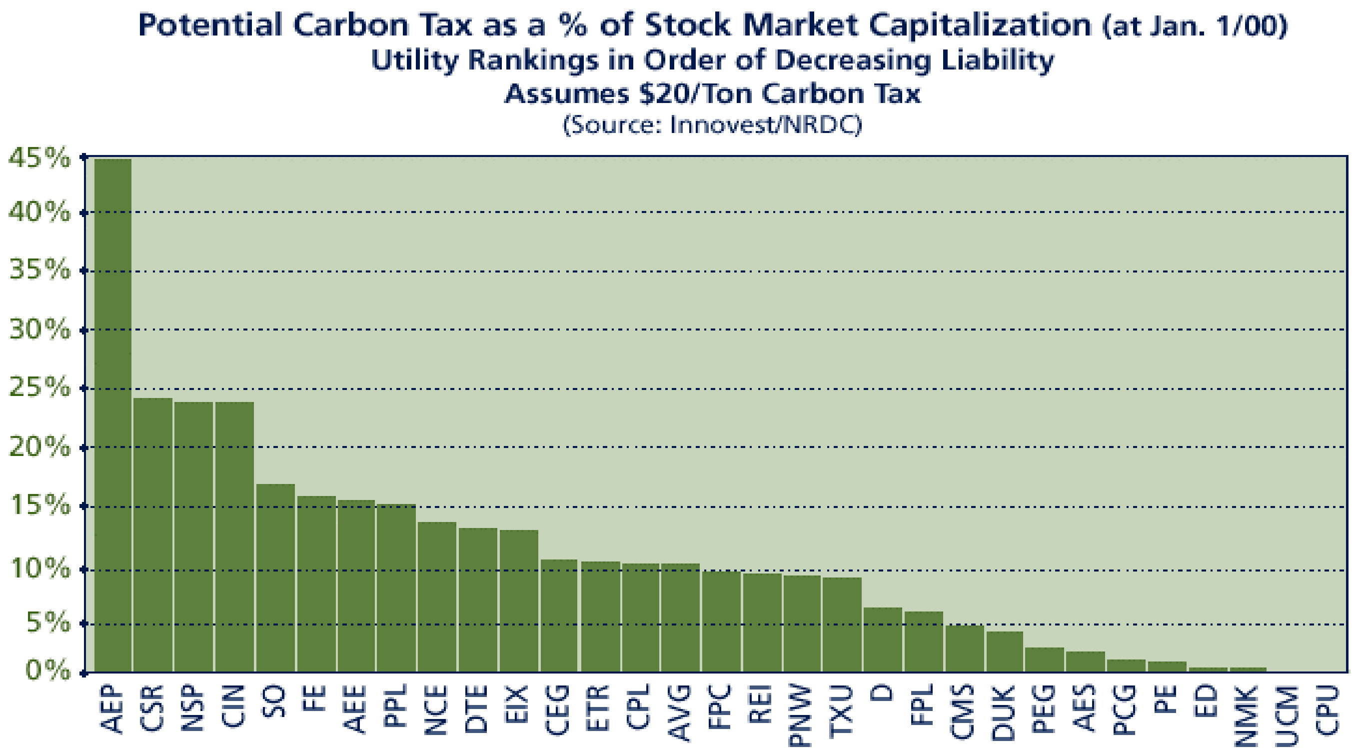
Risks to Companies & Shareholder Value

Major 'climate risks' to shareholder value :

- **Direct Cash Flow & Earnings**
  - **Market Share**
  - **Operating Costs**
  - **Project IRRs**
- **Brand/Reputation**
  - **Consumer boycott**
  - **'Employer of Choice' status**
  - **Stakeholder Relations**
- **Cost of Capital**
  - **Debt charges**
  - **Credit Risk**
  - **Insurance premiums**

Climate Change risk: Industry Variations

- **Significant differences exist between but also *within* industries**
  - **US Electric Utilities: discounted future costs of stabilising GHG emissions range from $1.2bn (AEP) to $51m (PSEG)**



Risks & Opportunities – industry examples

- **Transport (incl. Auto & Rail):**
- **Risk:**
- **direct charges due to emission reductions/higher fuel costs**
- **loss of competitive edge (US vs EU)**

- **Opportunity:**
- ***use of cleaner technologies***

- **Petroleum:**
- **Risk:**
- **direct reduction requirements**
- **disruptions in fossil fuel demand**

- **Opportunity:**
- ***natural gas in greater demand***
- ***renewables***

- **Tourism:**
- **Risk:**
- **exposure to extreme/changing weather patterns**

- **Opportunity:**
- ***eco' tourism***

- **Manufacturing**
- **Risk:**
- **costs associated with high energy & water use**
- **regulatory risks**

- **Opportunity:**
- ***increased demand for manufactured goods – fuel cells, UPS, micropower devices***

Other best practice examples...

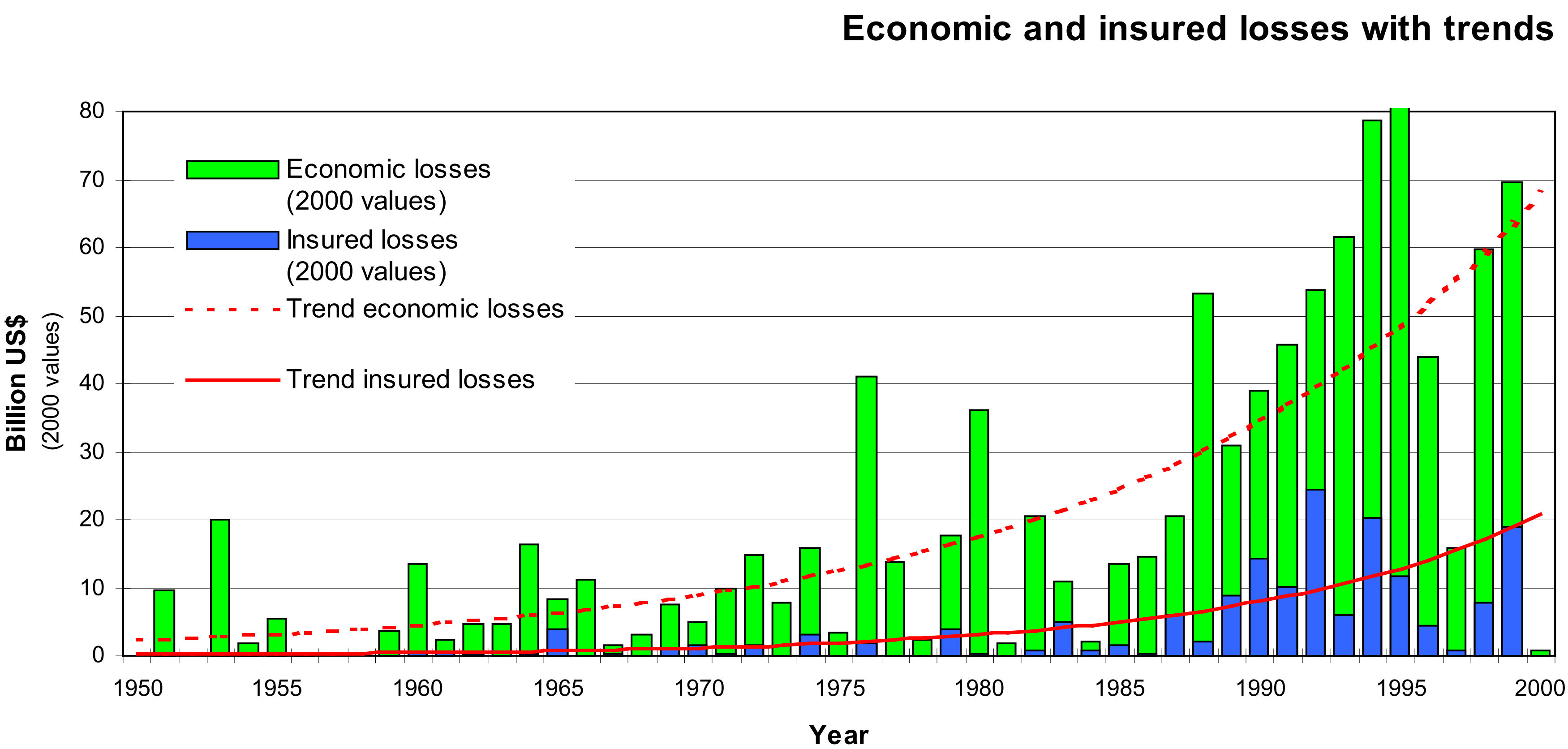
- **Alcoa: developing fuel cell-powered smelters**
- **RD Shell/BP: significant GHG reduction commitments**
- **Deutsche Telekom: savings of DM 8m from a/c output adjustments**
- **NTT: energy conservation targets of ¥100 bn over 10 yrs, under ‘business as usual’ scenarios – Japan’s largest electricity consumer**
- **Dupont: aggressive GHG reduction with no guarantee of credits**
- **ABB: developing low-carbon (intensity) technology as a differentiator**

Climate Change: Risks & Opportunities for the Financial Services Industry...

Risks to the Financial Services Industry

- **Climate change impacts will not be limited to a few ‘containable’ areas**
- **Rather, climate change will have a pervasive influence throughout the global economy creating risks across the financial services industry**
- **Precautionary action should be taken**
- **Financial services need to understand upside & downside of climate change...**
  - **e.g. worldwide economic losses due to natural disasters/severe weather events are increasing**

Economic & Insured Losses – trend since 1950…



So – the risks are clear....

Risks & Opportunities - examples

Financial services industry has broad risk exposure...

- **Insurance - Risks**
- **Liquidity problems due to increase in extreme weather effects & resulting payouts**
- **Uncertainty over potential regulatory changes**

- **Insurance – Opportunities**
- **Increased demand for insurance products (as risks increase)**
- **Safeguarding GHG offset/clean energy projects**
- **Microinsurance**
- **Alternative risk transfer/hedging methods**
- **Consulting/Advisory services**

Risks & Opportunities - examples

- **Asset Management – Risks:**
- **Macroeconomic disruptions affect long-term asset appreciation**
- **Hidden carbon liabilities**
- **Real estate holdings impaired by weather damage...**

- **Asset Mgmt – Opportunities:**
- **Outperformance from investing in climate leaders/ best-in-sector securities**
- **Climate-related theme funds**

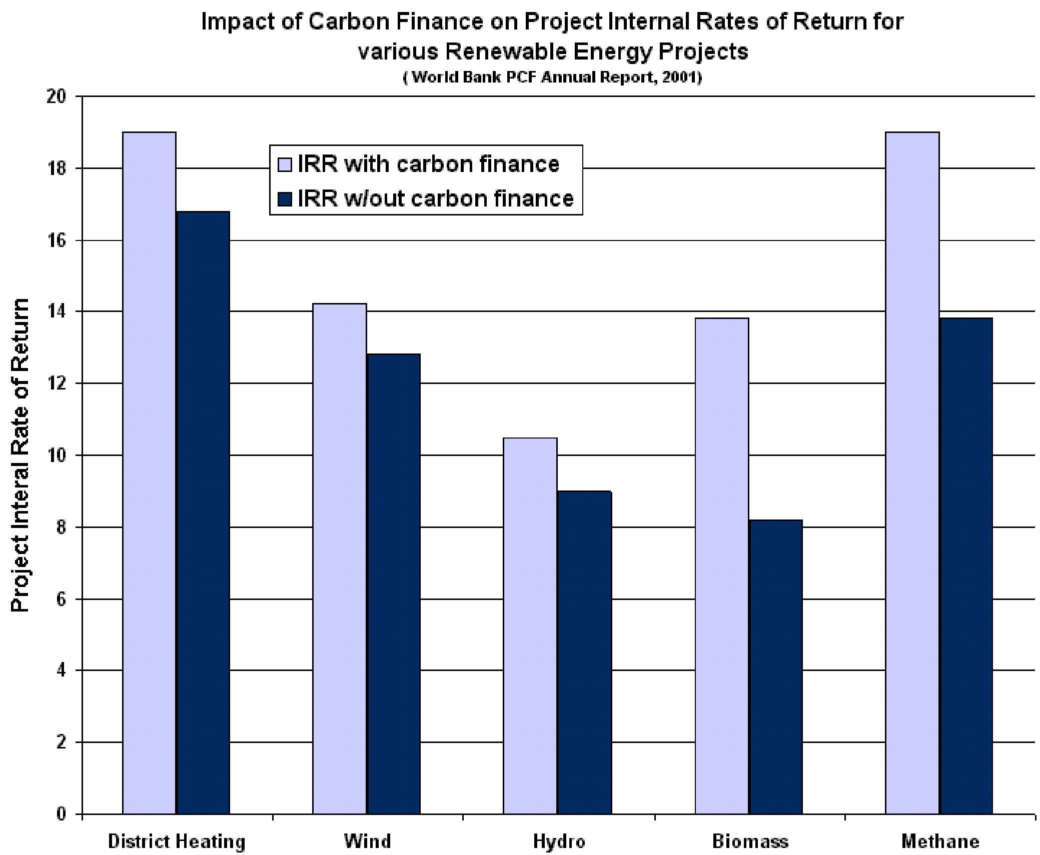
Risks & Opportunities - examples

- **Corporate/Retail Banking & Project Finance – Risks:**
- **Property damage risks to real estate & project finance**
- **Unanticipated GHG emissions reduction costs at project level**

- **Corporate/Retail Banking & Project Finance – Opportunities:**
- **Financing development of clean technology & renewable energy**
- **Lending policies – energy-efficient projects**
- **Enhanced project returns from sale of credits**

World Bank Prototype Carbon Fund (PCF)

Use of GHG credits has augmented Project IRRs...



Renewable Energy Market: estimated volumes

- **Major opportunities exist for ‘clean’ technologies**
- **Overall demand for renewables could reach 15% of worlds total energy needs by 2012**
- **Cleaner emissions profiles allows participation in GHG trading...**

ET vols expected to grow rapidly...

Source	Projection of Size of Greenhouse Gas Emmissions Trading Market
World Bank	\$10 billion by 2005
U.S. Council on Foreign Relations	\$2.3 trillion of trades completed by 2012
Energy Policy Journal	\$24–37 billion of trades completed annually during the period 2008–2012
Resource and Energy Economics	\$46.6 billion of trades annually (unspecified time frame)
The Economist	\$60 billion – \$1 trillion of trades annually (unspecified time frame)

Other best practice examples...

- **Reinsurance: Swiss Re & Munich Re**
  - **climate modelling & GHG trading markets**

- **Commercial Banking: Fannie Mae**
  - **‘Energy Efficient Mortgage’**

- **Asset Management: ISIS & USS**
  - **ISIS – developing carbon risk screening tools**
  - **USS – ground-breaking study on relevance of climate change to pension funds & asset managers**

- **Project Finance: World Bank PCF**
  - **Renewable energy projects with carbon finance**

Barriers to action

- **Despite a strong case for action:**
  - **The majority of directors, fiduciaries & financial professionals are not ready to act**
  - **Even amongst proactive – practical barriers to further action…**
  - **“Monday morning problem”**
- **4 main barriers to action:**
  - **Cognitive**
  - **Political**
  - **Analytical**
  - **Market**

Barriers to action

- **Cognitive**
  - **Issue competition**
  - **Culture clash**
  - **Lack of perceived materiality**
  - **Narrow idea of fiduciary responsibility**
  - **Risk characteristics**
  - **Carbon is ‘value-less’**

Barriers to action

- **Political/Regulatory**
  - **Lack of leadership & uncertainty over regulator commitment to ETS**
  - **Low recognition of CC factors by pension fund/fin services regulators**
  - **Climate modelling problems**
  - **Few incentives/targets to encourage investment in ‘clean’ technology/industries**
  - **Lack of capacity within low-income countries to develop (& compete for) new projects**

Barriers to action

- **Analytical**
  - **Lack of quantitative tools & convincing $$ arguments**
  - **Insufficient inclusion of ‘carbon analysis’ into commercial banking activities**
  - **Low awareness by key advisors within financial services industry**
  - **Lack of good quality, *material* data from companies**

Barriers to action

- **Market:**
  - **Lack of market mechanisms (links to political barriers)**
  - **Inefficiencies & complexities of ET markets undermines appeal**
  - **Issues of Scale**

Recommendations...

- Company Boards
- Investment Managers
- Professional Services (actnts/analysts/rating agencies etc.)
- Insurance & Reinsurance
- Commercial Banks/Project Finance
- Policy Makers & Market Regulators

For Further Information

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