MARSH

September 18, 2008

Renewable and Alternative Energy Being “Green” Has its Risks

ABA Environment, Energy and Resources Law Summit

Janet R. Carl, J.D.
Senior Vice President, Environmental Practice, Phoenix

Peter Mavraganis
Senior Vice President, Energy, Mining and Power Practice, New York

Scott W. Reynolds, J.D.
Senior Vice President, Energy, Mining and Power Practice, San Francisco

Agenda

- **Alternative and Renewable Energy Businesses**
- **Marsh Project Risk Management Process**
- **Risk Management Case Studies**
  - Carbon Capture and Storage
  - Biofuels
  - Solar
  - Wind
- **Q & A**

Alternative Energy Businesses

Solar

Wind

Biofuels

Hydrogen

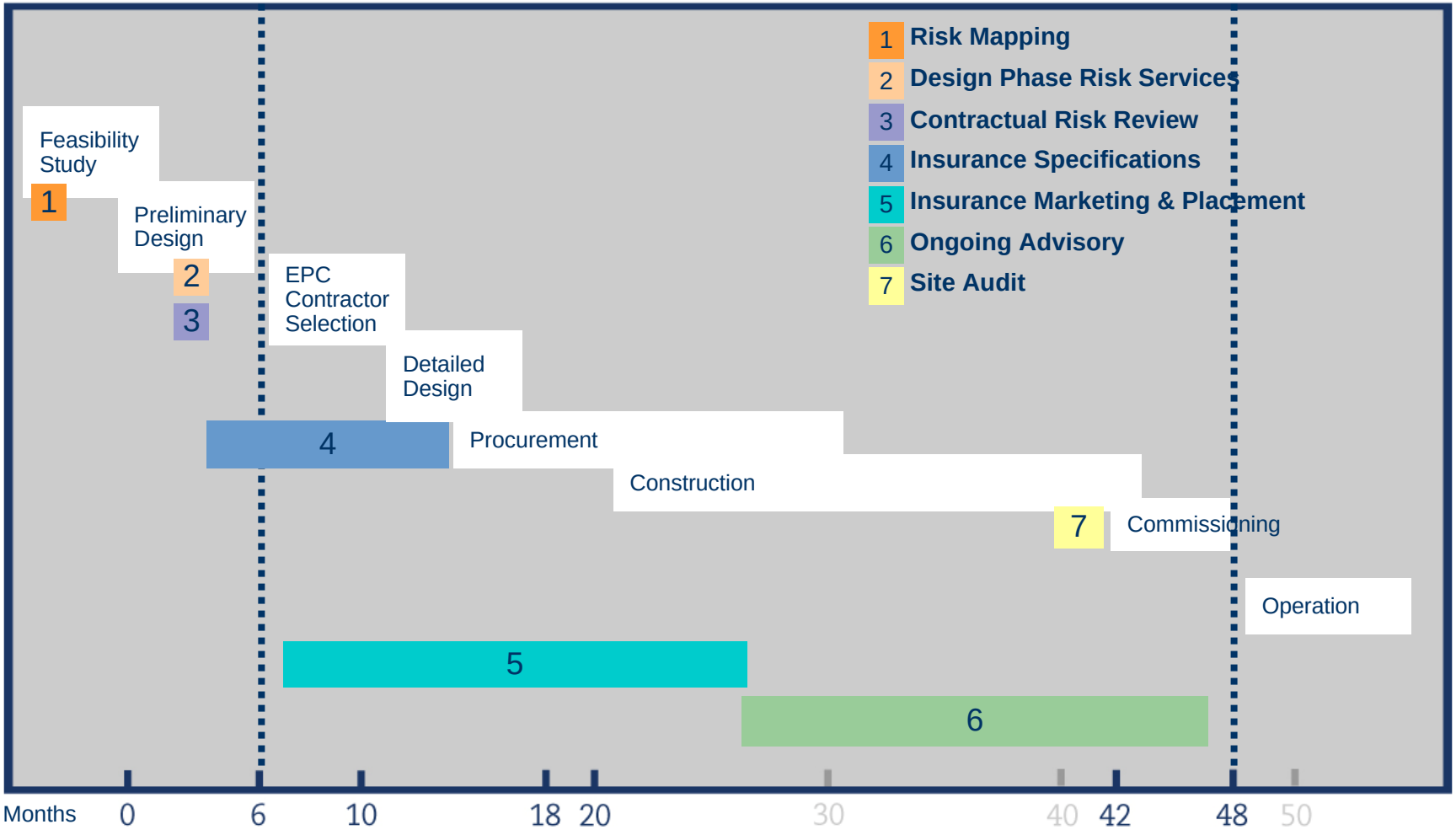
Marsh Energy Practice Specialties

- Solar
- Hydro-power
- Wind
- Geothermal
- Gasification / Hydrogen
- Biomass
- Biofuels
- Wave & Tidal
- Clean Coal
- Nuclear

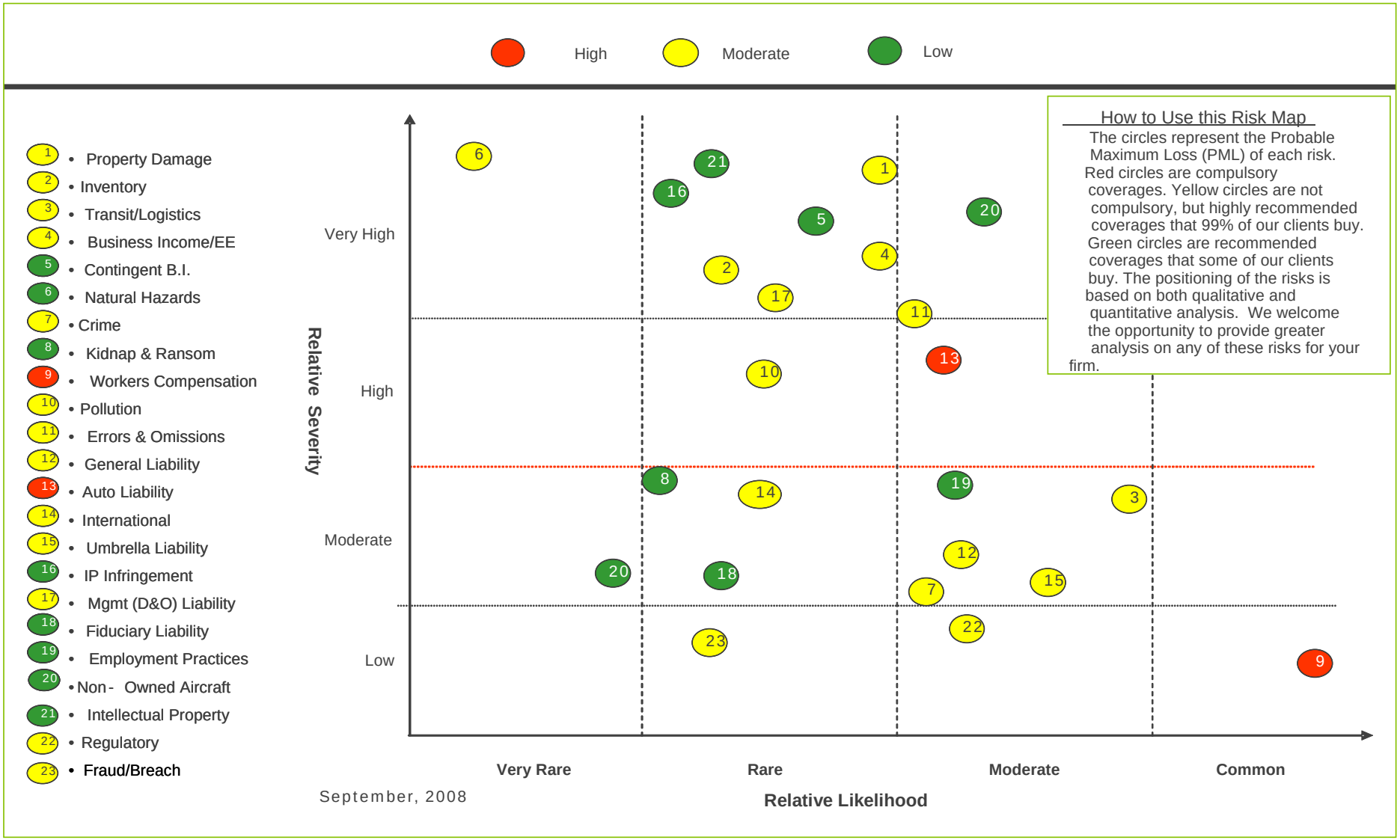
Factors Influencing the Growth of Renewable Energy
"The Perfect Storm"

Economic	Technology	Regulatory	Social Pressure	Environmental
▪High cost of oil & gas ▪ Increasing demand for power ▪ Financial mandates RPS/PTC/ REC'S ▪ Costs of carbon ▪ Need for growth	▪New and expanded methods ▪ Declining Costs	▪Drive for energy independence ▪ Kyoto Protocol ▪ Advanced Energy Initiative (U.S.) ▪ State and Regional Initiatives	▪Moral Pressure ▪ Image ▪ Goodwill ▪ Public Relations	▪Climate change/ global warming ▪ Desire for a cleaner environment

Marsh Project Risk Management Process



Sample Risk Map



Renewable Energy Risks

- Attractive Financing
- Catastrophic Capacity (Earthquake / Hurricanes)
- Corporate Governance
- Disallowance of Tax Credits
- Investment Return
- Investors/Joint Venture Partners
- Lack of Sun/Wind
- Limited Balance Sheet
- Rating Agencies
- Risk Assumption Capability
- Supply Chain
- Environmental Risks

Carbon Capture and Storage

Carbon Capture and Storage Risks

- **Environmental Risks**
  - Catastrophic or sudden release of CO_2
  - Damage to flora through accumulations of CO_2
  - Impact on groundwater through “gradual” leakage
- **Financial Risks**
  - Remediation costs
  - Third-party liabilities: toxic tort, property damage, diminution in value, third-party business interruption
  - Cost of plug and abandonment
  - Cost of liability due to loss of CO_2
  - Impact on business if CO_2 credits are traded or banked

Carbon Capture and Storage Risk Mitigation Strategies

- **Appropriate siting of sequestration facility**
- **Appropriate subsurface geologic surveys**
- **Insurance Products**
  - Casualty
    - Is a catastrophic loss sudden & accidental?
    - Sudden & accidental coverage may be available
    - If in AEGIS, ensure that disposal language does not exclude Geologic Sequestration
  - Environmental
    - Pollution aspects of geologic sequestration is insurable
    - Traditional environmental insurance covers gradual losses
    - Precedent: Numerous placements for subsurface gas storage facilities

Carbon Capture and Storage--Risk Mitigation Example
Confidential Client in Regional CO2 Sequestration Partnership

- **Risk Issues**
  - No indemnity from the State, Federal Government
  - Existing insurance doesn't cover disposal of "wastes"
  - CO2 considered "waste," sequestration considered "disposal"
- **Objective:**
  - Develop risk mitigation strategy to protect client and enable project to proceed
- **Solution**
  - Experience covering similar risks with hazardous, non-hazardous waste landfills and gas storage fields
  - Seeking from carriers:
    - First-party and third-party cleanup
    - First-party and third-party business interruption
    - Third-party bodily injury, property damage, diminution in property value
    - Natural Resource Damages
    - Gradual and sudden & accidental events
    - Affirmative coverage for civil fines, civil penalties, and punitive damages

Biofuels

Biofuels Risks

- **Technology**
  - Failure to Perform / Efficacy Risks
  - Mechanical Breakdown
  - Equipment Availability
- **Financial**
  - Commodity Price Risk
  - Tax Credit Risks
  - Price compared to other energy costs
  - Fuel Cost Risk
  - Cost of Construction/ Steel
  - Project Financing
- **Contract Risk**
  - Technology Provider
  - Contractor Experience
  - GC/EPC
  - Financier requirements
- **Natural Disaster**
  - Flood
  - Hurricane
  - Drought

Biofuels Risk Mitigation Strategy: Ethanol Producer, Long-Term Contract with Corn, Sugar Cane Producer

Risk Issues

- Severe weather conditions and/or precipitation impact crop yield
- Exposure to crop yield variations
- May need to purchase corn on spot market
- Exposure to corn price variations

- **Objective**
  - Create cost effective hedge and maintain margins
- **Solution**
  - "Weather & Energy Specialty Products" (WESP):
    - Protect against losses due to weather and commodity, agricultural, and power price and outage risks
  - Calculate Decrease in Corn Produced * Spot Price of Corn
  - Protect against unexpected increased cost of production
  - Covered by Weather Markets

Biofuels Risk Mitigation Strategy: Biofuel Producer with Construction Project Start-up

- **Risk Issues**
  - System start-up
  - Performance guarantee
  - Financial market comfort
- **Objective:**
  - Provide appropriate performance guarantee coverage
- **Solution:**
  - Systems Performance Insurance covers start up failure

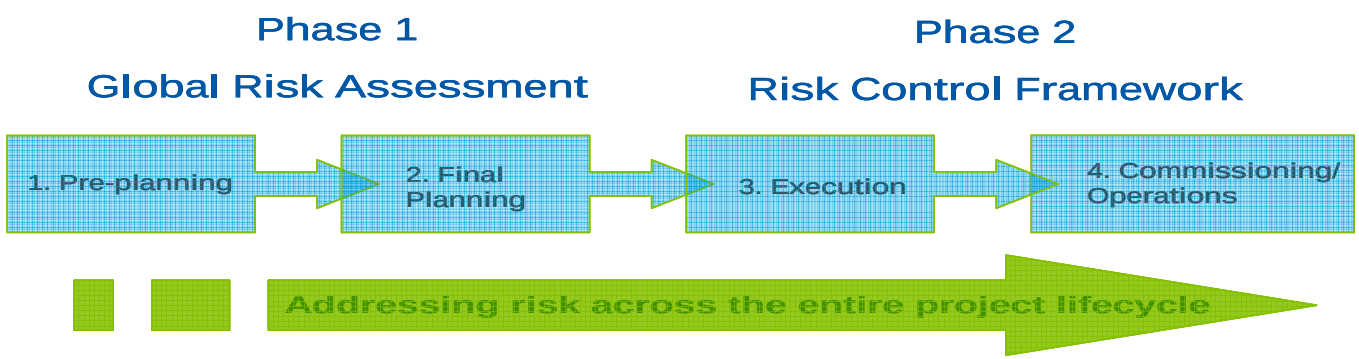
Solar

Solar Risks

- **Economic**
  - Price competitiveness relative to other energy sources
  - Cost overrun – equipment and labor cost escalation
  - Investment Tax Credits – regulatory removal
- **Technology risks**
  - Efficacy
  - Financing
  - Warranty
- **Supply Chain**
  - Silicon
  - Mirrors
- **Glass breakage during transportation**
- **Lack of sun / irradiation**
- **Power Outage**

Solar Technology: Risk Mitigation Strategies

- **Efficacy Coverage**
- **Warranty Protection**
- **Power Price Protection**
- **ITC Regulatory Protection**
- **Capital Project / Enterprise Risk Management**
  - Determines risk ownership among all stakeholders
  - Improved access to favorable financing
  - Satisfies rating agency risk requirements (S&P, Moody's, Fitch)



Solar Risk Mitigation Solution: Confidential Solar Energy Client

- Risks
  - Unproven technology
  - Attractive financing difficult
  - Performance guarantee demanded
    - Investors
    - Customers
  - Limited Balance Sheet
- Objective
  - Improve financing terms and enhance sales
- Solutions
  - Define/mitigate risks of loss via Capital Project analysis
  - Transfer to 3rd party insurer:
    - Performance guarantee
    - Warranty protection

Wind

Wind Risks

- **Supply chain capability**
  - Availability of turbines and construction equipment
- **Technology risk**
- **Lightning damage – adequate protection?**
- **Ground and soil conditions, environmental issues**
- **Construction site access**
  - Developments in remote or mountainous areas require careful preparation of roadways
- **Start-up delays**
  - Substations and power delivery
  - Damage to equipment while in transit
  - Installation damage
- **Contractor experience**

Wind Risk Mitigation Solution: Supply Chain Insurance

- **Marsh consultants:**
  - Identify Risk
  - Measure Risk
  - Mitigate and Treat Risk
- **Traditional property/cargo insurance coverage**
  - Must be triggered by physical damage
  - 2nd and 3rd tier suppliers usually not covered
- **Global Supply Chain Insurance**
  - Unique product of Marsh
  - Coverage applies to a disruption or delay from a named supplier
  - Coverage trigger includes terrorism, theft, natural catastrophe, labor strikes, political risk, or delay from virtually any cause
  - Suppliers of suppliers covered
  - Agreed loss value

PLL Facilitates Wind Farm Development on Former Coal Mine

- Wind Energy firm developing property in Appalachia for wind farm
- Due diligence identifies acid mine runoff from former coal mining
- Concerns:
  - Wind Energy firm deep pocket; former mining companies small
  - Site drained to popular scenic river
- PLL secured:
  - 10 years pre-existing conditions, 5 years new conditions
  - Natural Resources Damages, no exclusion for run-off
  - Damage to birds from turbines – “uninsurable”?
  - $25M in limits, $500K SIR
  - Premium: ~$500,000
- Owner-controlled CPL secured:
  - $5M in limits, $25K SIR
  - Premium: ~$60,000

Being Green Has Its Risks *and* Its Solutions

Risks

- Attractive Financing
- Earthquake, Hurricanes
- Corporate Governance
- Disallowance of Tax Credits
- Investment Return
- Investors/Joint Venture Partners
- Lack of Sun/Wind
- Limited Balance Sheet
- Rating Agencies
- Risk Assumption Capability
- Supply Chain
- Environmental Risks

Solutions

- Capital Project Analysis
- Irradiation/Lack of Wind Insurance
- Performance Guarantee
- Power Price Protection
- Risk Mitigation
- Supply Chain Analysis and Insurance Protection
- Tax Protection
- Warranty Protection
- Weather & Energy Specialty Products (WESP)
- Traditional Insurance Products

Questions?

Janet R. Carl, J.D., Environmental Practice Leader- West Region, Phoenix, 602-337-6228, Janet.R.Carl@marsh.com

Peter Mavraganis, Senior Vice President, Energy, Mining & Power Practice, New York, 212-345-2536, Peter.J.Mavraganis@marsh.com

Scott W. Reynolds, J.D., Senior Vice President, Energy, Mining & Power Practice, San Francisco, 415-743-8177, Scott.W.Reynolds@marsh.com

Access to MMC's Global Resources

Marsh & McLennan Companies

Risk & Insurance Services

MARSH

- Risk Management Consulting
- Risk Management Due Diligence
- Innovative Deal Solutions
- Deal Referral/Networking
- Portfolio Insurance Programs
- Post-Acquisition Services

GUY CARPENTER

- Reinsurance Solutions
- Specialty Practices
- Modeling & Actuarial Services

MMC ALTERNATIVE RISK SOLUTIONS

- Financial Risk Identification
- Insurance Capital Solutions

Consulting Services

MERCER
Human Resource Consulting

- Employee Benefits Due Diligence
- Retirement Benefit Programs
- Health/Group Benefits Programs
- Compensation Evaluation
- Management Evaluation and Structure

MERCER
Management Consulting

- Strategic Idea Generation
- Deal Sourcing
- Strategic Due Diligence
- Value Enhancement

MERCER OLIVER WYMAN

- Financial Services Strategy
- Risk Management Consulting

MERCER DELTA
Organizational Consulting

- Organizational Architecture
- Change Management

NERA
Economic Consulting

- Merger Bid Evaluations
- D&O Mass Tort Litigation Estimates

LIPPINCOTT MERCER
Identity & Brand Strategy Consulting

- Image Analysis
- Identity Planning

MARSH