

# Renewable Energy Technologies

## Role of Structured Finance and Structured Finance Incentives

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# Overview

- Because of economic and other barriers presented to renewable energy project development, successful finance frequently has depended on direct governmental subsidies, including tax benefits, subsidies and preferred power contract rates.
- The emergence of market-based programs in the environmental field and incorporation of green portfolio concepts into power deregulation have supplemented these tools with innovative approaches.
- Existing models are indicative of innovations in structured financing that may be possible, using “greenstream” credit support. These must be interfaced with available tax and power sales contract benefits.

# Outline of Presentation

- I. Structured Finance – The Challenges of Renewable Energy Projects
- II. Emerging Sources of Credit Support for Innovative Structured Finance of Renewable Energy Projects
- III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples
- IV. Conclusions: Future Innovative Structures

# I. Structured Finance – The Challenges of Renewable Energy Projects

## A. Elements of Structured Finance for Renewables

- Equity/Special Purpose Entity
- Debt Leveraging/Non-Recourse Debt
- Credit Enhancement/Offsets to Transaction Risks and Credit Gap

## B. Special Problems in Applying Structured Finance to Renewables

- Insufficient Equity Incentives (technological uncertainties)
- Uncertainties as to Cash Flow Firmness – Vulnerability to Market Trends
- Competitive Disadvantages (treatment of externalities and technical characteristics)
- Smaller size may limit conventional risk mitigation of traditional risk allocation issues, *e.g.*, contractual undertakings, performance and sovereign guarantees, sinking funds, insurance

# I. Structured Finance – The Challenges of Renewable Energy Projects (cont'd)

## C. Traditional Responses to Risk Gap Closure

- Mandatory Contractual or Portfolio Arrangements – *e.g.*, utility or governmental off-takes
- Subsidies; International Assistance; Loans; Grants
- Public and Private Insurance
- Tax Benefits – Impact of New Energy Legislation
  - Renewable Energy Production Incentive
  - Solar and Geothermal Business Energy Tax Credit
  - Solar and Geothermal Modified Accelerated Cost Recovery System

## D. Key Recent Developments

- Technology Improvements
- Emergence of “Environmental Commodities – “Greenstream Values”

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects

- A. Enhancing Economic Value through Improved Trading Regimes
  - The California Experience
  - The Texas Market
  - Prospects for Domestic Carbon Market
- B. Renewable Portfolio Standards Renewable Energy Credit Markets
- C. The Challenge: Turning Markets Into Credit-Backed Structures

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### A. Enhancing Economic Value through Improved Trading Regimes

#### 1) The California Experience: A Trading Model

- Essential Elements of an ERC – Basic to Understanding the Model
  - ERC must be a regulatory recognized emissions reduction – otherwise “valueless”
  - Must be:
    - Real/Surplus – Not subject of current or future mandatory reduction
    - Quantifiable
    - Permanent
    - Enforceable

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- ERCs can be Purchased or Created as Part of a Project
  - Can be created by voluntary emissions reductions and banked – with no project in mind
  - Can be created specifically for project by creating emissions reductions through negotiation and purchase
- But ERC “Market” Is Not a “Buyer/Seller” Market
  - Agency is a necessary intermediary
  - In all cases: ERC is usable only if “banked” or “approved by regulatory authority”

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- Financial Model Value of ERC Market
  - If you understand where to look for ERC opportunities, how to reduce barriers and uncertainties for the creation of ERCs, and how to obtain and preserve their integrity, they are real “assets”
  - Thus, even if ERCs are not used for “renewable energy” projects, the workings of the ERC market provide a useful model for understanding and developing “green goods” trading markets

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- Financial Aspects of ERC Creation
  - ERC is necessary project element, like a turbine
  - Provides value independent of project – if project fails, ERC remains an asset with value in the market
  - Due diligence essential to establishing its value; but not a standard “asset” evaluation/due diligence; rather a regulatory compliance due diligence
  - Key part of ERC acquisition process: sound planning and obtaining cheapest alternative
  - Can purchase entire ERC – or a portion, with attendant risks
  - Proper documentation is essential

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- Regulatory Issues
  - Demonstrates need for regulatory, or “Market”, improvement; need for reducing barriers, improving liquidity
  - Registered ERC “Owner” may not be “The” Owner
  - Banked (“Approved”) ERC may not be deemed valid by state (CARB) and/or EPA - many judges
  - All emissions “types” may not be interchangeable, *e.g.*, a mobile source derived credit may not be approved for stationary source use [ERC “permanence” requirement]
  - Credits are not tradable “one-for-one”; offset ratios typically are 1.2 to 1 or higher, *i.e.*, need to purchase 1.2 tons of  $\text{No}_x$  to offset 1 ton of  $\text{No}_x$  emissions.

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- New Regulatory/ERC Market Environment
  - Agencies are supportive/helpful
  - Agencies increasingly open to new credit techniques, *e.g.*, the mobile source/stationary source example

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- ERC Credit Creation Project Examples
  - Electrify irrigation pumps
  - Purchase and shut down a processing/manufacturing facility
  - Pave roads
  - Install vapor recovery systems on bakeries, dry cleaners, natural oil seeps
  - Implement natural gas conversion of facilities, such as of city garbage trucks, buses, and off-shore oil supply facility
  - Retrofit ferry boats with clean burning diesel engines

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

- Conclusion
  - ERCs are valuable assets
  - ERC trading is an essential component of project development
  - California experience provides lessons for developing trading markets for renewable energy projects

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### 2) Prospects for Domestic Carbon Market

- Domestic Commodity Exchanges
  - CCX
- Comprehensive Domestic Proposals
  - Proposed Federal Legislation
  - Multistate Compacts
- Industry Focused Innovation
  - Agriculture Initiatives
  - Focus on Overseas

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits

- Portfolio Standard Defined
  - RPS: Policy that requires electricity retailers in a state to provide a specific amount of total power from renewable energy.
    - RPS met with variety of renewable technologies but mostly wind.
    - Each state RPS is unique.
  - State that considered RPS in 2003:
    - CO, DE, GA, IL, MD, UT, VT, WA

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

- Renewable Portfolio Standards

<u>State</u>	<u>Standard</u>
ME	30% by 2000
MA	4% new by 2009
WI	2.2% by 2011
CT	13% by 2009
NJ	6.5% by 2012
PA	varies by utility
NV	15% by 2013; at least 5% solar
CA	20% by 2017
NM	10% by 2011
AZ	1.1% by 2007 50% solar
TX	2800 MW by 2009

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

- The Texas RPS
  - RPS is creating large wind farms
    - calls for 2000 new MW by 2009
  - TX RPS is effective because:
    - penalties for noncompliance, ease of siting
    - political support (PUC, Gov. Bush, Legislature)
    - distinct annual goals (exceeding targets)
  - Generating electricity at or below 3 cents/kWh
    - with help of federal production tax credit and great wind resource

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

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## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

- Design Features of Effective RPS
  - Cost-effective and flexible
    - if power from renewables too expensive, RPS on hold
  - Predictable
    - sets specific amounts & times: “X” MW by “X” year
  - Nondiscriminatory
    - applies to majority of power customers in state
  - Enforceable
    - has penalties for non-compliance; cheaper for power providers to buy renewable energy

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

- RPS Issues
  - What resources qualify?
  - Biomass resource issues:
    - MSW? Landfill gas? Closed loop biomass? Etc.
  - Are certain resources preferable to others?
    - Are those resources given “extra credit” towards compliance?
  - How much should the RPS cost?
    - Is there a cost cap of some sort?

## II. Emerging Sources of Innovative Structured Finance of Renewable Energy Projects (cont'd)

### B. Renewable Portfolio Standards/Renewable Energy Credits (cont'd)

- RPS Issues (continued)
  - What percentage should be required?
    - Should the requirement be phased in over time?
  - Who is covered? Utilities only? Others?
  - Are there or should there be penalties for non-compliance?
    - If so, how should those penalties be structured?
  - How to encourage in-state renewable

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples

- A. Pure-Air/SO<sub>2</sub> Control
- B. World Bank Prototype Carbon Fund (PCF)
- C. IFC - INCAF
- D. REC Purchase Proposals

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## A. Pure-Air/SO<sub>2</sub> Control

- Pure Air is a joint venture Air Products and Chemicals, Inc. and Mitsubishi Heavy Industries America, Inc.
- Bailly Generating Station of Northern Indiana Public Service Company hosted Pure Air demonstration (1992-1995)
- **Finance Model:** Pure Air installed and operated “scrubber” to 95% control for NIPSCO CAA compliance. SO<sub>2</sub> reductions beyond 95% were owned by Pure Air. Pure Air sold reductions in emissions trading market

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## B. World Bank Prototype Carbon Fund ("PCF")

- Project Valuation

- Purchase of Greenhouse Gas Certified Emissions Reductions ("ERs") from Projects that Will Qualify under "Clean Development Mechanisms" ("CDMs") or "Joint Implementation" ("JI") per Kyoto Protocol
- Standardization of Documents: The Challenge of Risk Management in Project Emission Reductions Purchase Agreements ("ERPAs")
- Risk Allocation: Project Sponsors and the PCF – Filling the Project Gap

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## B. World Bank Prototype Carbon Fund ("PCF") (cont'd)

- Key Issues
  - Key Aspects of Carbon "Asset Creation" for Projects
  - Financial Engineering – Key Credit-Related Provisions
  - PCF Pricing and Risk Mitigation

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## B. World Bank Prototype Carbon Fund ("PCF") (cont'd)

- Prototype Carbon Finance – Deficiencies from a Structured Finance Standpoint
  - Price Firmness Requirements
  - Timing of Availability of Credits
  - Existence of Monetizable Revenue Stream to Support Debt

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## C. IFC – INCAF

- Key Characteristics
  - GHG Purchase Facility – Not Project Market Creation Device
  - Alternative Types of Funding Available
  - Key Terms of Agreements
  - Project Selection Criteria – Narrows Scope of Potentially Purchased Credits

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## C. IFC – INCAF (cont'd)

- Multi-Step Process – Analogous to Project Finance Requirements
  - Screening
  - Selection
  - Validation and Registration under Kyoto Protocols
  - Project Appraisal and Structuring
  - Emission Reduction Purchase Agreement
  - Payments

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## C. IFC – INCAF (cont'd)

- Result: Project Revenue Enhancement/Not Project Finance “Greenstream”
  - Payment Not Guaranteed – Risks of Delivery
  - Difficulty in Banking as Long-Term Credit: Statutory and Project Finance Uncertainties
  - Limited Advance Payment Possibility
  - Not IFC Long-Term Credit Risk Product, Backed by Contract

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## D. Massachusetts Renewable Energy Trust Fund ("MTC") REC Purchase Proposals

- Statutory Definition: Renewable Energy Portfolio Standard
- Re-Assurance Initiative: Financial Tools to Facilitate Contracting/Resulting Long-Term Financing
  - Floor Price Guarantees – Put Options for RECs
  - Long-Term Contracts to Purchase RECs (offered through competitive auction)
  - Fostering Quarterly Auction or Spot Market by REC Generators
- Facilitation of Aggregation

# III. Steps Toward Green Credit-Backed Structured Finance: Lessons from Case Examples (cont'd)

## D. Massachusetts Renewable Energy Trust Fund ("MTC") REC Purchase Proposal (cont'd)

- Credit Support
- Market Flexibility

# IV. Conclusions: Future Innovative Structures

## A. Summary

- Cases discussed evidence: prospects for innovation in equipment finance; equity creation/return, leveraging, credit enhancement
- While green credit-backed cash flow streams are not yet the primary basis for structured finance, they enhance projects and facilitate their ability to overcome market barriers
- To support structured finance, governmental green credit market creation programs must be supplemented by regularized measurement and monetization mechanisms
- Both sufficient public incentives and carefully structured private transaction are keys to successful finance of projects
- Use of Green Credits must be carefully interfaced with tax and regulatory benefits

# IV. Conclusions: Future Innovative Structures (cont'd)

## B. Application to Financing

- Structured finance of renewables requires mechanism to assure firmness of the greenstream and/or its availability as a credit backstop
- Possible financial mechanisms, depending on the strength of markets and trading protocols, include:
  - Balance sheets of equipment suppliers
  - Strong trading market counterparties
  - Public agency purchasers or secured lenders
  - Private purchasers or secured lenders

# IV. Conclusions: Future Innovative Structures (cont'd)

## B. Application to Financing (cont'd)

- Depending on which mechanisms emerge, future financial tools may include:
  - Tranched debt - some portions backed in whole or part by greenstream credit
  - Greenstream-funded debt reserves
  - Third party credit enhancement or insurance to support greenstream availability
  - Derivative arrangements to support greenstream price uncertainty