Renewable Energy Feed in Legislation

The mechanism for N.C to become the regional leader in the emerging green economy, and reduce green house gas emissions

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Sources of Greenhouse Gas Emissions

- **40% from Electric Power Generation**
- 33% from Transportation
- 27% from Other Sources

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How to Reduce Greenhouse Gas Emissions

- **Increase Renewable Energy Generation in NC**
  - Secure Energy Infrastructure and Supply for Growth
  - Create and Attract New Export Industry North Carolina
  - Create New Jobs in North Carolina

- **Renewable Energy Portfolio Standard Enacted Dec. 2007**
  - 12.5% of Electricity must come from Renewable Sources by 2021

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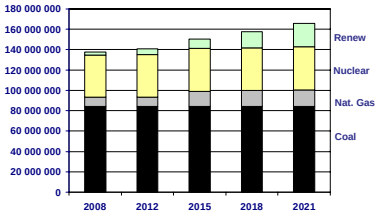
Current NC REPS Requirement

- 3% in 2012
- 6% by 2015
- 10% by 2018
- 12.5% by 2021



  - Solar and Hog Waste Cut Outs (0.2%) by 2021

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Challenges with Existing Legislation

- **Developers, Banks, :**
  - Uncertain Return on Investment
    - Monetizing 30% Federal Tax Credit exp 2016
    - Monetizing 35% State Tax Credit expire 2010
    - Uncertain Value of offset Carbon Credit
    - Uncertain Payment for Electricity Generated (PPA)

- **Utilities:**
  - Uncertain cost recovery mechanism
    - buying or building Renewable Energy
    - increased cost related to distribution and transmission of Renewable Energy
    - Uncertain value for RECs

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How to Create a Market Now

- Define a rate that the Grid operator will buy electricity generated by a specific Renewable Energy Source

$$\frac{\text{Investment Cost + Operating Cost + Project Profit}}{\text{Annual MW Hours of Production x Expected Years of Operation}} = \text{Feed in Rate (FIR)}$$

- Solar Example

$$\frac{\text{\$5M(IC) + \$1.5M(OC) + \$1M (Profit)}}{\text{1500(MWhrs) x 20(yrs)}} = \text{\$0.25KWh (FIR)}$$

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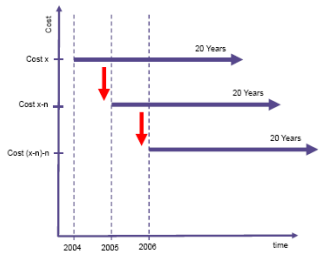
Provide Longterm Certainty

- Lock in FIR for 20 yrs plus year of installation
- Provide long term Financial certainty and ROI
- Degression to average gird cost



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Paying for a REFIR System

- Developer invests in RE power plants, generate RE KWh
- Utilities buys power at specified "Feed In Rate"(FIR) for each KWh generated. (25c)
- Utilities recover additional cost plus profit by spreading over all KWh sold.
  - 25c (REFIR) - 9c (Ave. Grid Rate) =
  - 16c (net increase) + 11% utility profit (2.6c)=
  - 18.6c per KWh of RE sold
  - Recovered with minimal increase on all KWh sold

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Example of REFIL Cost Recovery for 20% REPS by 2025

Year	Std MWh Rate	Total MWH	Gross Revenue	RE %	RE MWH	Ave. FIR	Net Incr. +11% Prof.	Incr. MWH Rate	% Increase	Kwh Incr.
2012	85	140 000 000	$11 900 000 000	4 %	5 600 000	154	$ 495 505 618	89	4,0 %	$0,004
2015	90	147 821 000	$13 303 890 000	7 %	10 347 470	138	$ 672 098 090	95	4,8 %	$0,005
2018	95	155 654 000	$14 787 130 000	14 %	21 791 560	112	$ 669 070 843	99	4,3 %	$0,004
2021	100	163 000 000	$16 300 000 000	17 %	27 710 000	106	$ 543 619 101	103	3,2 %	$0,003
2025	105	170 000 000	$17 850 000 000	20 %	34 000 000	103	$ 360 863 989	107	2,9 %	$0,002

- No Loss of State Tax Revenues!
- No dilution of the value of the Tax Credit for project developers!
- Financial Certainty for utilities, Developers, Investors, Banks
- Minimal increase in Electricity cost
- RE Generation becomes preferred source of generation

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Protect Utility Revenues and Profits

Allowing Utility to add their standard profit on top of the FIR is Critical.

- Utility must guarantee stable power delivery with non base load RE generation.
- Utilty must interconnect new distributed generation into grid.(T&D)
- Utility must upgrade grid to manage new generation and reduce losses.
- Utility must administer REFIR payments, submit for NCUC approval and charge rate base.
- Utility is owned by Investors and required to show revenue and profit stability and growth.

Duke Energy
Progress Energy
Dominion

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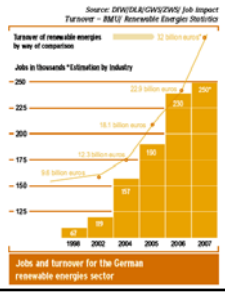
Economic Development Opportunities for NC

- REFIL will create a new green industry and new companies in North Carolina utilizing existing workforce and creating new jobs.



- Utilty Jobs
- Upstream Suppliers
- RE Manufacturers, Export
- Downstream Developers and Installation Companies
- Financial Services
- Training in Community Colleges
- Research and Development in Universities

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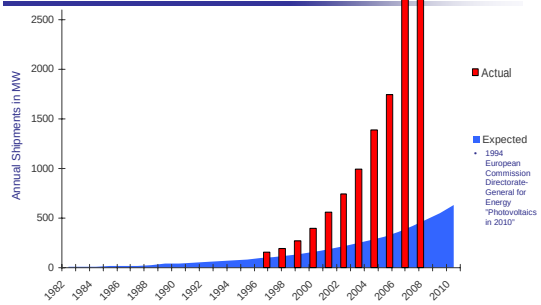
Historic Forecasts vs. Actual Growth



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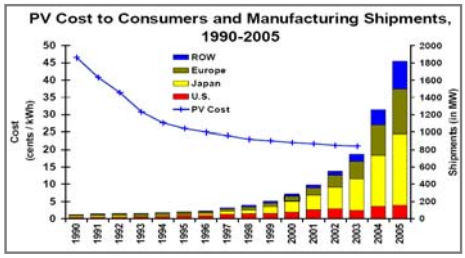
US Solar Manufacturing



- The US went from #1 to #5 in Solar from 1995 to 2005

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Questions

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Include Nature Conservation Principles

- The REFIL must include principles that protect the Environment.
  - Wind: Landscape preservation, wildlife conservation…location offshore
  - Solar: Open Space ground mounted PV systems limited to reduce deforestation, green space depletion
  - Hydro: Ecological condition of water must be improved
  - Biomass: Deforestation prohibited.

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Prioritize RE Generation new FF generation

- Renewable Energy power plants must be given priority for all new electricity generation.
- When the grid is operating at full capacity, conventional power stations must at times reduce their electricity production.
- The grid system operators must immediately expand their grids in line with the expansion of renewable energies.

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Renewable Energy Feed in Legislation REFIL

1. Set Feed in Rate for RE Generation
2. Set FIR Duration period with Digression to Grid Parity
3. Sets Cost recovery Mechanism
4. Protects Utility Revenues and Profits
5. Maximize Economic Development Opportunities for State
6. Include Nature Conservation Principles
7. Prioritize RE Generation over new FF Generation

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Create definitive Rate paid for Renewable Energy Fed into the Grid

- 32 Countries have Implemented Solar Feed in Rates
- 4 US States have FIR legislation active at present
- 1 US City has implemented a FIR

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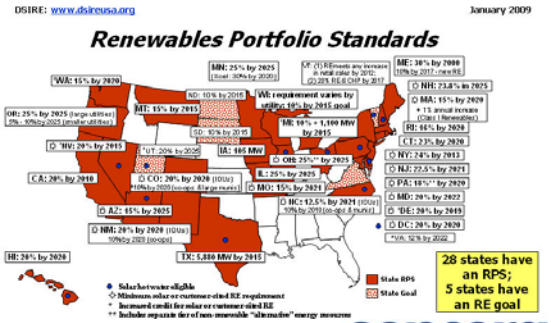
Can NC Become a Leader?



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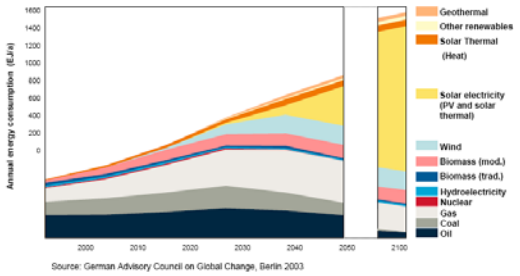
The Market for Solar Power



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