Renewing Utility Income

Utility Opportunities in Renewable Energy

A CCN/M.S.G. Management Counsel White Paper

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Executive Summary

Utilities must stop thinking of renewables as a burden at worst and a public relations opportunity at best. Some already face state renewable mandates; more will come. The abandoned 2003 federal energy bill did not mandate renewable energy quotas but proponents are likely to renew efforts to require 100,000 to 200,000 MW of renewable energy capacity by 2020. Current and proposed state legislation could result in 20 – 30 per cent of this figure. Renewable power on this scale is an opportunity to create a new income stream.

How can utilities participate in this market fraught with business and political risks? Most companies are looking at three options: (a) the build, own and operate model, (b) purchasing green power or credits (c) a mixture of these two strategies. Many will find a strategic fit among these options. But at this stage in the development of renewable power some companies have an opportunity to play a strategic integration role and reap rewards while facilitating market development.

The build, own and operate model is the asset acquisition model traditionally employed by utilities. It is also the model most often used by developers. But it may not be optimal for many utilities looking to comply with renewables mandates.

- Many utilities won't want (or don't have the capability) to locate, design and build renewable energy facilities.
- Renewables involve a fairly steep learning curve and few companies have enough native demand to achieve economies of scale or technology diversity.
- The renewables industry is very fragmented, complicating the task of making technical choices and selecting business partners.
- Even though some utilities or their affiliates have the capability to build and operate and the scale to achieve economies there is no reason to believe that there is a market demand for 20-30 new, redundant utility programs. (Although this may initially occur and inflate a renewables bubble.)

On the other hand, relying exclusively or heavily on contract renewable power may also be risky.

- Long-term contracts may be difficult to lock-in or hedge.
- Revenue streams and investment needs are likely to be out of phase. Revenues will come from short-term standard offer power supply contracts and retail sales. Investment will involve long-term commitments.
- Executives who remember cogeneration and QF power contract problems may vow never again to be trapped in onerous contracts but can never be sure that this foray into government-assisted energy decision making will turn out different.
- Buying contract clean power or green tags also limits the opportunity to profit from the development of renewable power.

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- The historical experience demonstrates that just because you have a contract and just because the regulators told you to do it, doesn't mean all the risk has been transferred to customers.

A profitable renewable energy business model must (a) deal with the fragmented and rapidly evolving industry structure, (b) mitigate the uncertainty and risk perceived by investors and customers, (c) leverage the strengths and assets of utilities or affiliates, (d) be financially designed to optimize all of the potential revenue streams, and (e) address public policy objectives

When an emerging industry is fragmented and in flux, a bold move by a strategic integrator can pull the pieces together, influence the market shape and earn above-average returns. The Renewables Network Manager (RNM) business model enables a leading utility to play a strategic integrator role pulling together many of the fragmented pieces of the emerging market and profiting at several points in the value-chain.

In the basic RNM model, a lead company – the network manager – undertakes the role of acquiring and managing the competencies necessary to build/own/operate renewable energy facilities. It also enlists and manages a network of partner-investors, primarily utilities or affiliates who provide equity financing for undivided interests in the facilities and agree to purchase shares of output. On the supply side, the network manager develops another network of vendors and suppliers who share both rewards and risks in exchange for favored position in the network. The RNM model is flexible and can be easily modified to fit different regulatory and market situations.

The RNM has many advantages over the buy, own, operate and contract power models,

- Portfolio benefits from diversifying the renewable energy technologies and reducing the exposure of a participant to outage or project failure
- Cost management through scale and scope efficiencies:
  - Buyer leverage over suppliers to secure price concessions and risk sharing arrangements
  - Managing the steep technology and public approval learning curves
  - Fleet-driven economies in standardization, construction, and siting
  - Pooled project development, financing and operations management
- Fungibility and scalability to better match load and required capacity across network members
- Collaboration and joint investment among a number of utilities may reduce the volatility of local or regional markets
- Innovative financing based on securitizable and tradable revenue streams from power and REC sales may be employed to spread risk
- Network members or co-owners may realize returns rather than simply expensing a purchased power contract (PPC) while ownership of physical assets constitutes a hedge against market volatility

- Trading efficiencies by managing output sales and renewable energy credit (REC) sales and purchases centrally.
- Public acceptance because competitors can become partners and the monopoly utility is not perceived as the sole party in interest

The RNM concept and the underlying analysis are outlined in the remainder of this note

Guide to this White Paper

This paper has seven sections in addition to the executive summary above:

- ***Political Uncertainty on Renewables Continues*** provides a brief synopsis of the character of leading federal and state legislative efforts to promote renewables.
- ***Regulatory and Legislative Strategy Issues*** discusses the need to develop positive policy positions while learning from the PURPA and Energy Policy Act of 1992 (EPACT) experience
- ***Renewable Energy Market Size and Potential*** surveys renewables' current contribution, estimates the size shape of the renewables sector under various mandates and the likelihood of fulfilling them
- ***Renewable Energy Costs and Performance*** provides a brief overview of the economics of leading renewable technologies
- ***Revenue Streams for Renewable Energy*** discusses the implications of the multiple cash flows associated with renewables and the implications for planning and operations
- ***Renewable Energy Industry Structure and Business Models*** surveys the current industry structure and discusses implications for entry strategies
- ***Renewables Network Manager (RNM) Business Model*** describes an approach to capitalizing on renewables opportunity and managing associated risks.

Political Uncertainty on Renewables Continues

The political situation remains fluid but that is not an excuse to take a wait-and-see approach. Taking an active role now has three advantages:

- You can still influence the shape of the market
- If you wait too long you will be relegated to a passive buyer
- Properly approached, there may be a profitable business opportunity

Although the August 14, 2003 transmission debacle in the northeast U.S. and eastern Canada had nothing to do with capacity or fuel shortages, it helped those who advocate renewable power and it eroded public confidence in the current power supply and transmission regime. This may re-ignite congressional efforts to mandate ambitious renewable portfolio standards (RPS).

As of this writing the Senate has punted on an ambitious renewables plan, re-passed its 2002 bill and sent it to a conference committee likely to report out a version of the House 2003 Energy Policy Bill. Despite or because of the political limbo at the federal level, state efforts to stimulate renewable energy are accelerating. Texas, California[1] and New York are currently leading the pack but New England and Middle Atlantic states are showing increasing interest. The shape of the political battleground and the likely marketplace is defined largely by seven parameters:

- **Investment incentives**. Primarily tax credits for qualifying facilities,[2] these can be the biggest part of project value. Credit transferability remains a disputed issue.

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[1] The Governor of California signed legislation enacting California's Renewable Portfolio Standard (RPS) - SB 1078 - on September 12, 2002. This legislation, which requires retail sellers of electricity to purchase 20 percent of their electricity from renewable sources by 2017, establishes California as having the most aggressive RPS in the country. Renewable sources include biomass, solar thermal, photovoltaics, wind, geothermal, fuel cells using renewable fuels, small hydropower of 30 megawatts or less, digester gas, landfill gas, ocean wave, ocean thermal, and tidal current. Municipal solid waste is generally only eligible if it is converted to a clean burning fuel using a non-combustion thermal process. There are restrictions for some of these technologies.

Under the RPS, retail sellers of electricity are required to increase their procurement of eligible renewable energy resources by at least 1 percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. The RPS legislation requires that the Energy Commission and CPUC work collaboratively to implement the RPS and assigns specific roles to each agency. The two agencies are currently developing rules that will apply to investor owned utilities (IOUs), and will later develop rules for Electric Service Providers and Community Choice Aggregators. Municipal utilities are ordered by the legislation to implement RPS programs under their own direction. [Source:DSIRE]

[2] In some states there are also privately financed incentives including so called "green tag" payments.

- **Production incentives**. Annual payments of 1.5 to 2.5 cents per kilowatt hour may be granted some or all technologies. (Wind currently receives a 2.5 ¢/kWh production subsidy while solar does not.)
- **Federal or state purchase quotas**. Some proposals call for graduated federal electricity purchase standards up to 7.5 or 10 percent. State plans vary.
- **Renewable portfolio standards (RPS).** These quotas, usually ramped up over 2005 – 2020, vary from 4 to 10 percent of supply with outliers such as California calling for 20 percent. At the high end, the quotas might crowd out new conventional capacity.
- **Compliance responsibility and penalties**. Who – the retail utility buyer or the wholesale power seller – is subject to the RPS varies across proposals? The retail seller (utility) in California, the wholesale power seller as proposed in New Jersey. RPS compliance penalties also vary.
- **Renewable energy credits (REC).** In many proposals, a separable and tradable REC would be issued for each kWh produced by a qualifying facility.
- **Qualifying facility definitions**. Renewable energy is usually defined to include wind, solar, biomass and hydroelectric with some jurisdictions adding geothermal, tidal, landfill methane and even some fuel cells. But new hydroelectric sites or dams are ineligible in some proposals. The definition of biomass is often narrowed to discourage incineration of recyclable materials such as paper.

We discuss in the next section the opportunity and necessity of trying to shape these parameters to form a reasonable public policy.

Regulatory and Legislative Strategy Issues

At what point does the utility industry see the writing on the wall and attempt to edit it to their advantage? The utility industry expended a great deal of political capital opposing major legislative and regulatory changes from PURPA to market restructuring. It made much less effort to shape state and federal initiatives to support utility strategy. The usual result: rules that favored competitors at the expense of utilities. Often, utilities and their affiliates were closed out of new opportunities entirely. Unless utilities work actively to structure the renewables market, history will probably repeat.

Most utility public policy strategies on renewables have been shaped by their experience under PURPA and EPACT. Although there are similarities, there are important differences from the PURPA qualifying facility (QF) experience.[3] In the PURPA episode utilities were required to purchase all QF power offered at prices set by state regulators. Many utilities wound up paying dearly to buy out over-priced contracts they felt pressured to sign in the first place[4]. Some states have proposed similar programs for both renewables and distributed generation. One New York utility executive noted sardonically about state proposals to encourage distributed and renewable power through net metering at retail rates "if you liked 6¢ [PURPA] power, you're gonna love 12¢ [renewable] power.

In contrast to PURPA, most proposed federal and state energy bills set purchase quotas but not prices. The retail utility or the wholesale power seller supplying the wires company can meet its quotas by buying renewable energy, renewable energy credits (RECs) or so-called green tags. Who bears compliance risk is a critical issue. In some states, utilities have tried to shift responsibility to wholesale power suppliers.

Renewables projects will likely be less highly leveraged than the debt-driven PURPA machines made possible by the utilities' obligation to buy every kWh offered at attractive prices, Most "standard offer" wholesale purchase power agreements have short terms that will not support long term investments. If this condition isn't cured in future legislation or regulation, projects will need substantial equity investment.

Utilities that want to seize the opportunities offered by renewables must develop and execute a regulatory and legislative strategy. An effective strategy will lead to a market

[3] IPP and merchant power players are largely outside the renewables sector today although a few merchant power companies are exploring renewables. Given slow demand growth and present capacity margins, high-end RPS targets might cause renewables to displace conventional power in the new plant stream.
[4] One possible similarity with the IPP era is that the renewables industry might experience the same sort of boom and bust cycle. The once-thriving IPP and merchant power sectors spawned by PURPA and EPACT have been distressed as over-capacity emerged, trading margins shriveled and natural gas prices rose. There are some signs a renewables bubble could occur as many rush to the entrance.

structure in which utilities have a fair opportunity to profit from renewables. Failure to develop and execute a strategy will, at best, yield operating burdens and cost pass-ons without the chance of gain.

The particular strategy will vary from company to company, but will follow a few basic principles:

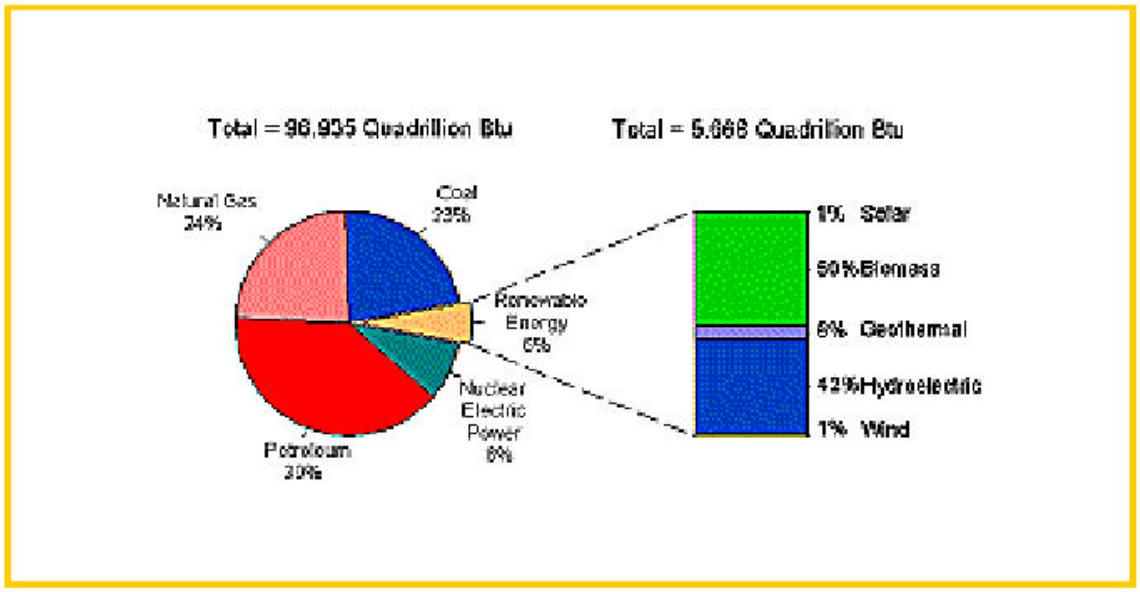
- Based on and consistent with corporate objectives
- Developed with input from across the company, not just public affairs, legal, or finance
- Responsive to the legitimate concerns of other interested parties, especially
  - Customers
  - Regulators
  - Market participants
- Politically practical.

Renewable Energy Market Size and Potential

Many renewables advocates envision a truly audacious renewables industry. For example, recent Senate legislation sought to create, in a little over 16 years, a renewable energy fleet comparable to or larger than today's nuclear power plant fleet. The bill now in conference calls for renewable power to meet 10 percent of supply by 2020.

Depending upon the mix of eligible technologies chosen to meet the RPS mandates and their capacity factors, somewhere between 100,000 and 200,000 MW of renewable capacity would be needed by 2020 if the 10 percent mandate were enacted. The low end of that range is probably more likely because higher capacity-factor technologies such as biomass and wind would dominate the mix. Using a moderate $1500 per kW capital cost results in a cumulative investment requirement of about $195 billion by 2020. It's hard to envision goals like these being met. At some point sanity and market forces would call for a reassessment. For planning purposes a more realistic 20 year estimate is probably closer to 40,000 -50,000 MW – still very large numbers.

Renewable energy, including hydroelectric, accounted for only 6% of U.S. energy supply in 2001. Many in the green and renewable communities do not favor building new hydro; only hydroelectric capacity upgrades and additions at existing sites were eligible in the 2003 Senate bill. Removing hydroelectric capacity's contribution reduces the remaining solar, biomass, geothermal and wind contribution to less than 4% of the nation's Btu supply. Using a broader hydro-inclusive definition, the EIA's Annual Energy Outlook (AEO) for 2003 projects renewable energy production to increase from 5.5 to 8.7 quadrillion Btu between 2001 and 2020.



Source: Energy Information Administration (EIA)

Renewables make an even smaller contribution to the electricity system. With the exception of hydroelectric, large wind farms and geothermal in the west, relatively little renewable power is connected to the grid or produced directly by electric utilities. In 1997, non-hydroelectric renewable energy accounted for only 2 percent of total U.S. electricity generation[5] and less than 10 per cent of that was produced by utilities[6]. Biomass is the largest non-hydro renewable source of electricity (1.5 percent), followed by geothermal (.3 percent) with wind and solar accounting for only (.12 percent).

The table on the following page provides some sense of the magnitude of the task of meeting a graduated 10 percent RPS mandate.

[5] This appears to be higher than the proportion required by 2005 in the draft legislation, but since all companies would have to meet that level, it is likely that additional sources will be needed. For whatever political or social reasons, some companies may choose to exceed the required level.

[6] For example, of the 86 billion kilowatt-hours domestically generated from non-hydroelectric renewable energy sources in 1997, nonutility power producers accounted for 91 percent and electric utilities 9 percent. EIA Chapter 5 Issues for Renewable Fuels in Competitive Electricity Markets,

Estimated Renewables Capacity Requirements						
Year	Electricity Production mWh	Electricity Growth Rate	Renewables Quota	Resource Portfolio Standard (mWh)	Assumed Capacity Factor	Cumulative Required Renewable Capacity MW
2002	4.00E+12	1.02	0	0.00E+00	0.5	-
2003	4.08E+12	1.02	0	0.00E+00	0.5	-
2004	4.16E+12	1.02	0	0.00E+00	0.5	-
2005	4.24E+12	1.02	0.01	4.24E+10	0.5	9,691
2006	4.33E+12	1.02	0.01	4.33E+10	0.5	9,885
2007	4.42E+12	1.02	0.022	9.72E+10	0.5	22,182
2008	4.50E+12	1.02	0.022	9.91E+10	0.5	22,626
2009	4.59E+12	1.02	0.034	1.56E+11	0.5	35,667
2010	4.69E+12	1.02	0.034	1.59E+11	0.5	36,380
2011	4.78E+12	1.02	0.046	2.20E+11	0.5	50,205
2012	4.88E+12	1.02	0.046	2.24E+11	0.5	51,209
2013	4.97E+12	1.02	0.058	2.88E+11	0.5	65,859
2014	5.07E+12	1.02	0.058	2.94E+11	0.5	67,176
2015	5.17E+12	1.02	0.07	3.62E+11	0.5	82,696
2016	5.28E+12	1.02	0.07	3.69E+11	0.5	84,350
2017	5.38E+12	1.02	0.085	4.58E+11	0.5	104,474
2018	5.49E+12	1.02	0.085	4.67E+11	0.5	106,563
2019	5.60E+12	1.02	0.1	5.60E+11	0.5	127,876
2020	5.71E+12	1.02	0.1	5.71E+11	0.5	130,433

Renewable Energy Costs and Performance

The mandates being sought will not favor all technologies equally. One photovoltaic (PV) industry leader says: “PV won’t be a big beneficiary of proposed portfolio standards. At $7000/kW and 15-20% capacity factor, PV will be bypassed primarily by wind and, depending on jurisdictional renewable definitions, landfill gas or even natural gas fuel cell demos. However, although PV is the highest cost per kW, it is lowest cost per photo opportunity and it has the broadest public appeal so most portfolio developers should want to do a little. But wind will be the big play, and wind is long lead-time, hard to site technology.”

Although utilities will play a role in the delivery end of the value-chain, most are unlikely to develop the competencies necessary to be competitive in solar or wind technology.[7] Wind moreover can be politically disruptive in many regions, as Cape Wind has discovered trying to create a wind farm in Nantucket Sound. Solar, as noted above, can be a potent public relations tool. There are many responsive private public facilities to install and bear the costs of modest units.

In our opinion, utilities should look hard at biomass and try to ensure fair rules of the road for its development.

- Biomass is among the more "competitive" renewable energy sources, albeit with a significant range of costs depending on feedstock type and availability
- The balance of plant, perhaps 60% of costs, are familiar and similar to conventional steam plants, mitigating project and operating risks somewhat
- Biomass offers an opportunity for utilities to serve as community problem solvers. There are upper Midwest plants successfully using the same raw material found in cow pies. Groups of utilities may even be able to build regional biomass plants that efficiently dispose of agricultural or forestry wastes.
- Hybrid energy plants may accelerate biomass development much as hybrid gas/electric cars have outperformed pure electric vehicles. Biomass may flourish if hybrid or blended applications are eligible for pro-rata RECs. A "tolling" plant that burned both biomass and fossil fuel that qualified for pro-rate RECs would likely be more reliable and better able to track with market prices.

EIA Comparative Technology Costs

Technology	Capacity (MW)	Overnight Capital Cost (1995 $/kilowatt)	Variable Plus Fixed O&M (1995 mills/kWh)	Capacity Factor (Percent)	Const. Lead Time (Years)	Levelized Cost (1995 mills/kWh)
Combustion Turbine	160	329	10.8	85	2	60.3
Combined Cycle	250	480	20.6	85	3	59.3
Biomass	100	2,630	11.3	80	4	84.3
Geothermal	50	1,765	10.8	80	4	37.6
Solar Thermal	100	3,064	12.5	42	3	107.8
Solar PV	5	4,283	4	28	2	196
Wind	50	778	9.4	31	3	40.2

[7] Some, primarily southeastern, utilities have invested directly in solar energy

Renewable Energy Revenue Streams

This is an incentives-driven business. Depending on technology and jurisdiction a renewable energy project may generate cash flow from tax credits, subsidies, REC sales and, of course, kWh sales. These multiple cash flows give rise to opportunities for creative financial products, especially when integrated with other tradable credits such as SO_2 and, possibly, CO_2 if current discussions on a cap-and-trade approach bear fruit.

Energy and credit marketing capability may become an important competitive advantage. Under many proposals the government would issue producers a separable and tradable REC for every qualifying kWh. The REC can be sold separately from the electricity. Utilities could buy RECs to comply with their RPS; others could buy them to feel good. "Aggregators" such as Green Mountain Power already consolidate the output of many "green" producers and sell tranches of certified green power to utilities or end customers. Intermediaries for RECs already exist. Conservation Services Group is a national market maker while Mainstay Energy has created a "green tag" market in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. [8]

It is difficult to predict the market clearing prices of tradable credits. We have learned from earlier trading proposals that initial estimates of the cost of credits are often far off the mark. The sulfur dioxide trading system initiated in 1990 as part of the Clean Air Amendments has been very successful. But beforehand, people were estimating that an allowance might be worth as much as $500/ton of SO2 emitted. Actual prices, of course, are much lower (as low as $100).

Effectively, the REC allows producers to reduce the price of their renewable energy by the value of the credit. If there is no renewable power price premium – power is power – then the RECs will sell for the difference between the price of renewable and conventional power up to the level of the non-compliance penalty, if any. Market inefficiencies are likely to result from the interaction of State and Federal programs and from the public relations need to be green. That is especially true if the costs of renewables are treated as pass-throughs for retail customers.

Because there are significant and persistent regional price differentials for conventional and renewable power, RECs will be worth more in some regions than others. Thus there may be substantial inter-regional trading in RECs. But because RECs are fungible paper or electronic commodities they should trade nationally at a common market clearing

[8] Mainstay makes a one-time payment per kW of capacity of $100 and $50 for solar PV and wind, respectively. The money for this incentive does not come from state or federal governments, nor utility companies, but rather from the sale of green tags to environmental markets. These tags are "unbundled," from the electricity at the point of generation, and can be sold independently.

price. The likelihood of a common national REC price has several important consequences:

- It tends to support renewable energy production in the most advantageous locations for each technology, making small local efforts even less economic,
- It means that relatively efficient companies will earn more "producers surplus" making it worthwhile to consider how to gain scale and scope economies
- It provides an opportunity for firms with trading competencies to earn arbitrage profits and construct hedge products.

Renewable Energy Industry Structure and Business Models

Solar, wind, geothermal and biomass have very different technologies, industry structures and business models. There are several business models in the renewables sector

- Focused value-chain players such as component manufacturers, marketing aggregators and green power traders
- Total value chain or turnkey developers including some of the large PV and wind power companies
- Build, own and operate developers and, in some cases, utilities

Solar PV manufacturers include relatively small companies like AstroPower and Evergreen Solar competing on the basis of advanced technologies as well as oil company subsidiaries such as BP Solar and Shell Solar.[9] Kyocera has forged an interesting business model based on the fusion of information technology with solar and offers a range of integrated units to several market segments. Kyocera thus captures project design and build value while achieving standardization economies in manufacturing and maintenance.

Wind power has a number of small providers but large companies such as GE Wind Power[10], NEG Micon and Vestas dominate the utility scale turbine business. Most of these companies offer a full range of project development and site management services. The European market is much more developed than the U.S. giving companies there an installed base and some scale advantages. Biomass is the most eclectic of the renewable energy sources. Although it is in many respects the technology closest to central station steam generation, there are many potential feed stocks promoted by numerous interests and producers.

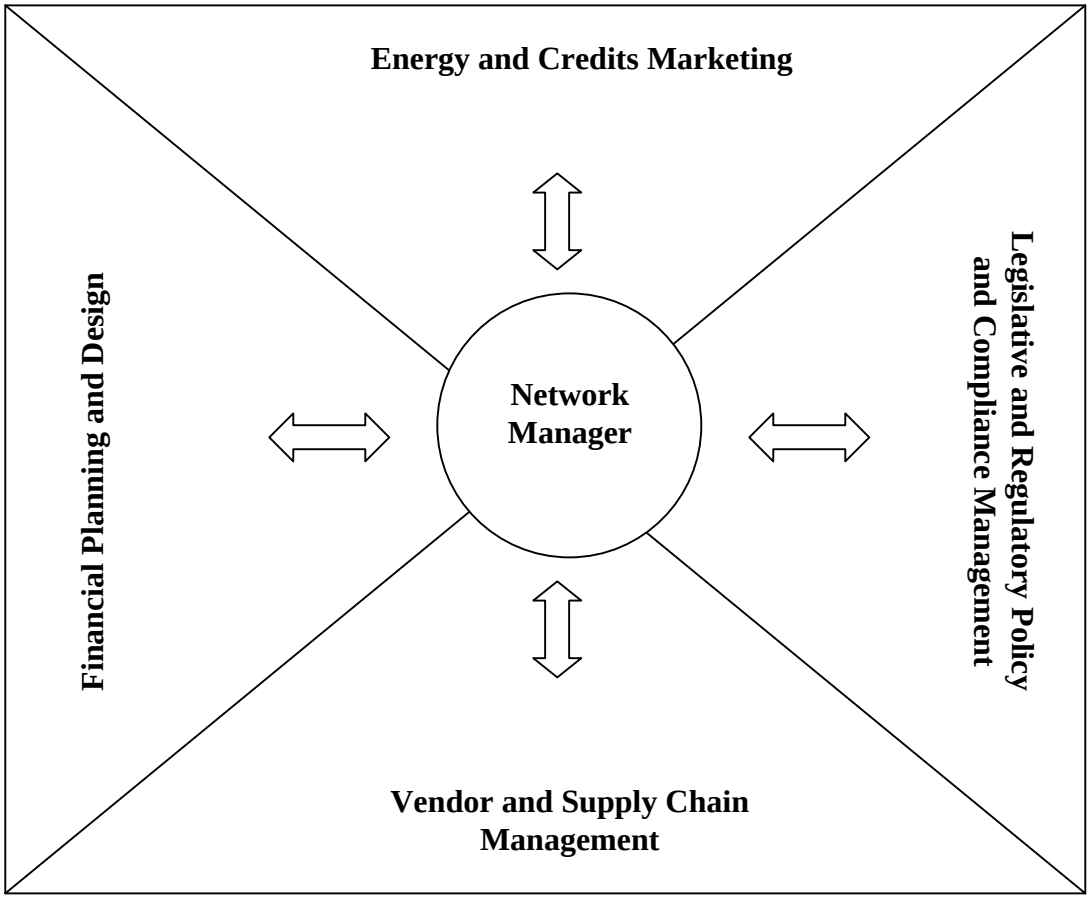
[9] Other than deep pockets, it is difficult to see shared competencies or technical overlaps between the oil and solar industries. Some observers expect the remaining oil companies to recognize this and exit as Mobil did several years ago.

[10] GE bought the Enron wind business out of bankruptcy and is reported to have a $1billion book of business

Renewables Network Manager (RNM) Business Model

CCN/M.S.G. believes that the Renewables Network Manager (RNM) business model, outlined here, offers a strategic platform for entering the renewable power business. In the basic RNM business model, a leading company – the network manager – assumes the lead in acquiring and managing the competencies necessary to build/own/operate renewable energy facilities. It also enlists a network of partner-investors, primarily utilities or their affiliates, who provide equity financing for undivided interests in the facilities and agree to purchase shares of output. On the supply side, the network manager develops a community of vendors and suppliers who share both rewards and risks in exchange for a favored position in the network. The basic RNM model is flexible and can be easily modified to fit various legislative or regulatory situations.

The diagram below illustrates the four key business areas that determine the value of renewable energy assets.



Financial Planning and Design

The net present value of the renewable energy asset is derived from some or all of the following: tax credits, operating subsidies, green credit sales, and energy sales. Assuming successful project implementation and eligibility for the tax benefits, the major financial risks derive from risks associated with the price of energy, the market value of green credits, operating risks, and renewable demand/supply balances. For particularly favored technologies such as wind, much of the value is derived from up-front tax benefits making them relatively less risky.

Long-term PPA contracts are desirable to attracting outside investors in most renewables projects. As noted earlier, many utilities are inhibited from signing long-term wholesale contracts for standard offer power. Either the regulatory framework can be modified or a means of attracting long-term investors, especially equity investors, must be found.

We think that one way to do this is to create a joint-investment entity in which a number of utilities or others invest in a portfolio of renewable energy projects. This network of investors has the a number of specific advantages over solo programs:

- Spreading the risk and sharing in scale economies across a larger market and capacity base
    - Scale facilitates cost management by increasing leverage over suppliers
    - Greater output levels makes it easier to create innovative products combining energy, REC and emissions credits
- Utility dominated projects may be perceived as less risky thus increasing outside investor confidence
- Joint investment entities allow for integrated planning on a regional basis and so may reduce the potential of a bubble and bust cycle
- Site acquisition or utilization of existing sites and transmission interconnection may be easier and less costly

The network manager's role in the financial planning and design activity would include:

- Attracting other utilities, including co-ops and municipals, as partners
- Taking the lead in securitizing and selling investments based on the expected revenue flows and
- Marketing excess tax credits, if any.

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Legislative and Regulatory Policy and Compliance Management

A group of utilities working together would likely face lower regulatory risks than any individual company by (a) constituting a larger counterweight to less responsible advocates, (b) working to harmonize regional policies and (c) economizing on compliance management.

The public policy effort has two stages, an initial effort to shape legislation and regulatory policy followed by ongoing compliance management efforts. In the first stage the network manager should take the lead in developing consensus on and promoting:

- Consistency across federal and state initiatives in terms of eligibility definitions, resource portfolio standards, pricing
- Flexibility in trading renewable energy and emissions credits, e.g. no state or regional restrictions on origin or disposition of credits
- Tax credit transferability
- Clearly defined obligations for both the retail utility and wholesale power marketer
- Uniform investment and production subsidies across technologies
- Reasonable rules for long term PPA commitments sufficient to support investments in renewable
- Reasonable frameworks for affiliate renewable energy transactions
- Flexibility to pursue hybrid conventional/renewable generation

In the ongoing compliance management stage the network manager has a number of roles:

- Leading siting and permitting processes
- Managing the REC certification process
- Identifying and suggesting remedies for lingering problems in the enabling legislation and regulation

Vendor and Supply Chain Management

Putting together a significant fleet of renewable plants calls for strong supply chain management skills. As noted previously, the renewable energy sector is fragmented and immature. In addition, entrants face a very steep learning curve.

However, the scale achieved by the RNM business model facilitates vendor and supply chain management:

- Cost management through scale and scope efficiencies:
- Leverage over suppliers to secure price concessions
- Intellectual capital capture and application

- Fleet-driven economies in standardization, construction, siting and site optimization

In many new businesses, vendors are reluctant to assume any project and business risk and demand up-front payment thus increasing first costs. In a network model like RNM, vendors may be asked to share business risk by accepting output or performance based payments in return for favored partner status on the network. The network manager's role in vendor and supply chain management includes:

- Developing exceptional understanding of vendor capabilities
- Developing vendor performance contracting and management processes
- Monitoring vendor performance
- Qualifying vendors and managing the procurement process
- Developing a standard fleet model

Energy and Tradable Credits Marketing

The evolution of separable and tradable "attributes" for energy commodities puts a premium on sophisticated pricing and derivatives creation to maximize the value of output. It is likely that third-party traders, probably drawn from the financial community, will emerge to dominate this activity. Until an efficient and transparent market develops, the producers will have to market their output either through standard power bids or bi-lateral transactions.

The network manager role in marketing includes:

- Identifying renewable power bidding and auction opportunities
- Developing partnerships with wholesale power sellers looking to outsource their renewables component
- Identifying bi-lateral renewable energy transactions
- Profile potential prospects for borrowing, lending or selling credits

Conclusions

Renewable power is here to stay. Some utilities can serve as strategic integrators and capitalize on the industry's immature state to build new businesses. They can't do this the old-fashioned way of trying to do everything on the value chain but they can create networks of people and businesses that can collaboratively perform all functions. Some utilities meet the requirements of this network business model such as familiarity with the electricity system, regulatory and public policy experience, project management and financial credibility. The opportunity is here.

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