Michigan Land Use Institute & Michigan Energy Alternatives Project
Present
A Proposal to Traverse City Light & Power:

20-20 BY 2020

A Clear Vision for Clean Energy Prosperity

APRIL 2010

Creating Jobs
Saving Energy & Money
Helping Schools and Community Groups
Reducing Emissions

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This report was prepared as part of the Institute's Energy and Environment program, which is preserving Michigan's abundant resources by promoting green jobs that protect the Great Lakes and reverse climate change.

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Bold Solutions for Michigan's People and Places

To read the National Resources Defense Council report on California's success with energy efficiency, visit *http://mlui.org/downloads/EECalifNRDC03-09-10.pdf*.

Part I: Introduction/Summary

Traverse City Light & Power is at a critical crossroad. At the end of 2014, a coal-fired contract that supplies half of the utility's power expires. A new study commissioned by the utility finds that TCL&P must generate 30 to 39 megawatts of new power by 2028 to satisfy the needs of its customers. How will TCL&P fill the gap?

TCL&P has committed to leading the state's shift away from importing and burning fossil fuels, particularly coal, for electricity; its goal is 30 percent renewable energy by 2020. Currently, 99 percent of TCL&P's energy comes from fossil fuels.

We strongly support TCLP's renewable energy efforts.

However, this proposal presents the company and the community with a somewhat different, equally realistic, more jobs–and economy-friendly goal: "20-20 by 2020"—a 20 percent reduction in energy demand from "business as usual," and 20 percent of demand met by renewable solar, wind, and landfill gas-powered electrical generation by 2020. This proposal views biomass or natural gas as "bridge" baseload technology to help reach and then surpass these goals.

Moving quickly towards these goals, if done correctly, creates jobs; saves energy and money; redirects formerly exported energy dollars towards local schools, community groups, and entrepreneurs; stimulates local economic growth; and reduces harmful emissions, including climate-altering greenhouse gases.

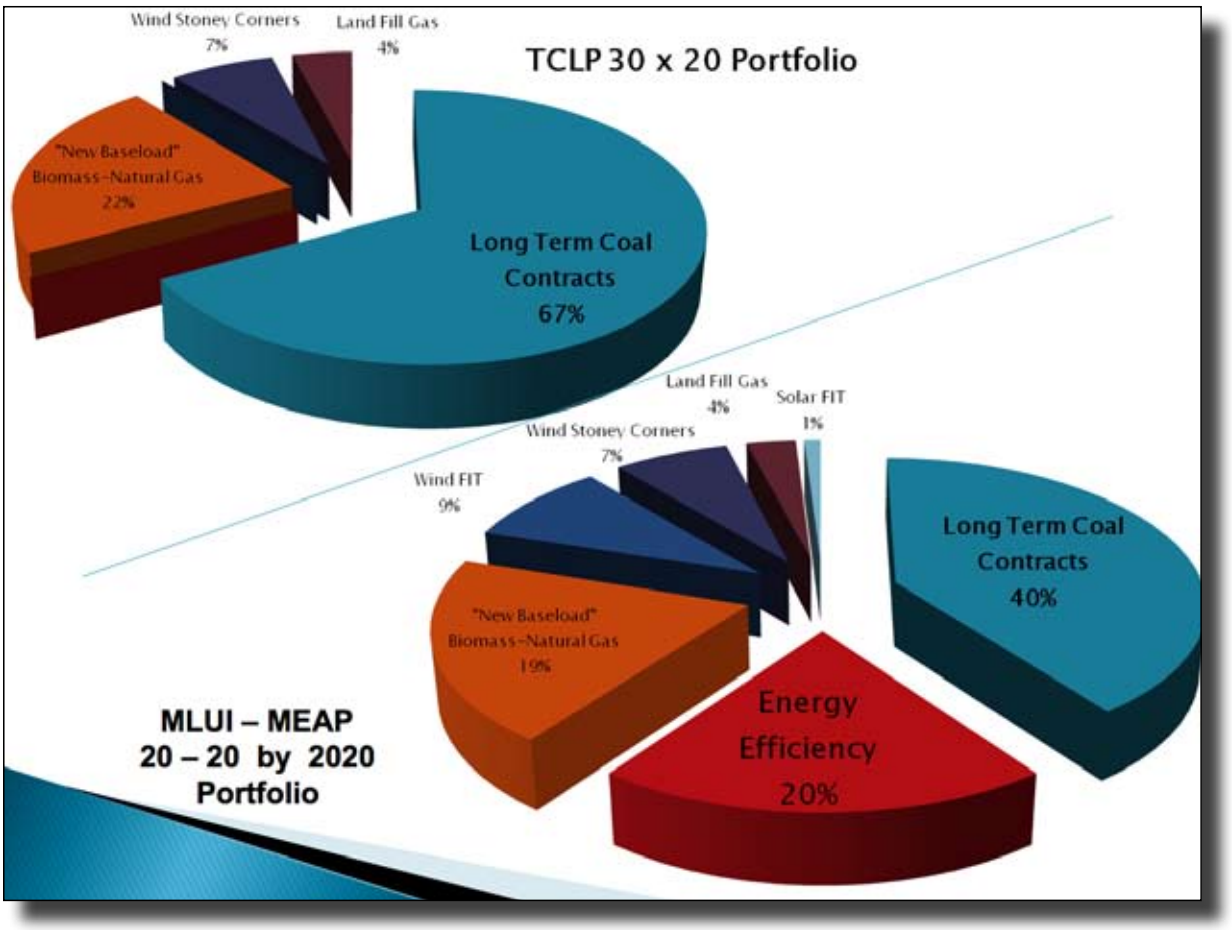
Steps to Success

To execute this scenario, TCL&P should:

1. Adopt energy efficiency as a primary factor in its forward-looking plan.
2. Team up with governmental units to create a regional energy office.
3. Reshape TCL&P's business model with decoupled electric rates, demand-side management, less investment in new generation, more investment in customer efficiency, and a revolving fund for additional residential and commercial efficiency.
4. Establish solar- and wind-power Feed-In Tariffs to accelerate community-based solar and wind power development.
5. Confirm the expansion of its landfill gas program.

We support TCL&P's proposal to build a small amount of biomass power because the technology is easily scalable, provides base load, adds jobs, and allows TCL&P to lead the state in establishing comprehensive procedures that protect and improve forests and facilitate a new, local, organic, fast-cycle bio-fuel sector.

Sustainably sourced biomass fueling a combined heat and power plant is clearly superior to coal because it slows energy dollar exports to coal-mining states, increases local energy independence, cuts greenhouse gases, eliminates mercury and other emissions, and slows destructive mining techniques.



A comparison between TCL&P's 30 x 2020 generation plan and the 20-20 by 2020 plan.

20-20's Advantages

20-20 by 2020 benefits the entire community because it:

1. Saves energy dollars.
2. Re-circulates energy dollars in the community.
3. Protects ratepayers from sharp spikes in fossil fuel costs, especially coal.
4. Encourages local job formation and economic growth.
5. Offers profitable opportunities for local schools, non-profits, and entrepreneurs.
6. Increases environmental protection.
7. Establishes Traverse City's clean-energy leadership, a key to prosperity.

It also protects individual electric ratepayers because it:

1. Cuts their energy consumption and costs.
2. Utilizes more wind power, which is cheaper than new coal power and is still declining in price, thanks to industry growth and new technologies.
3. Replaces expensive, fossil-fueled, hot-day "peak spot market" power purchases with solar power, which, although expensive, is predictably priced.

4 Offers customers lower rates through demand-side management.

5 Uses biomass as a lower-cost alternative to new coal power.

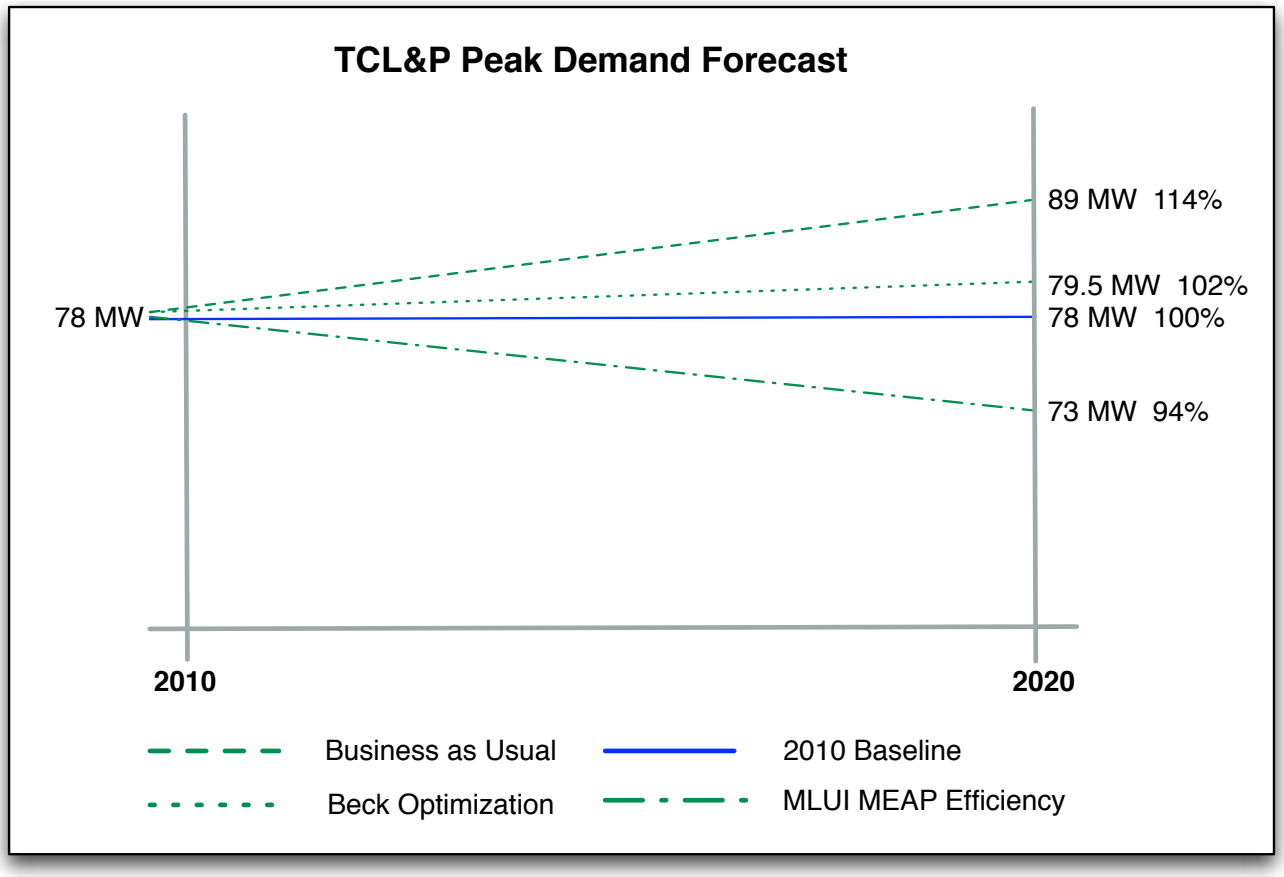
6 Allows for short-term contracts for natural gas, whose long-term price, many industry experts say, will continue to decline.

There are economy-of-scale and other savings, a growing number of federal and state programs, green rate options similar to those that TCL&P has used in the past, and other instruments outside the scope of this paper that can help with the company's transition to clean energy.

Part II: Energy Efficiency

Executing a highly aggressive energy efficiency program is the most important, lowest-cost step TCL&P can take to secure adequate base load.

Currently, TCL&P proposes cutting energy demand by 12 percent from "business as usual" by the year 2020. Our research indicates that we can do more. We propose a very ambitious 2 percent annual gain in efficiency. By striving for that gold standard, TCL&P cuts its annual Kwh demand from business as usual by 20 percent by 2020. This graph compares "business as usual" with the Beck Energy Optimization projection and our own proposed 20 percent cut by 2020.



Reference from Beck Demand Graph

Efficiency's Advantages

This approach has two major advantages. First, saving a kilowatt-hour costs about half of what it costs to generate a kilowatt-hour—about 3 cents/saved Kwh, according to a recent, real-world study. TCL&P's average generating cost is 5.3 cents/Kwh.

Second, because they would use less electricity, ratepayers save money.

Those savings make it far easier to install renewable energy sources, which, like new fossil fueled-power, cost more than current coal power: While any new energy source pushes up electric *rates*, lower consumption pushes down electric *bills*.

The 8 percent in efficiency gains beyond TCL&P's current plan also reduces the amount of biomass power the company needs, probably eliminating the proposed second and third of the three 10 MW plants TCL&P is contemplating—freeing up to $50 million for customer efficiency investments.

Efficiency Opportunities and Success Stories

Compared to leading states, Michigan is woefully behind in facilitating energy efficiency measures. That means there's a big opportunity for major efficiency gains, i.e., "low-hanging fruit," in Traverse City.

It is instructive to look to other places that have accomplished efficiency savings of 25 to 40 percent in time spans of several months to several decades.

California utilities, for example, began using energy efficiency programs in the mid-1970s. Since then, California's per capita electricity consumption increased only slightly, while the rest of America's roughly doubled. This suggests that reductions of 40 percent in per capita annual electricity use are possible.

A study by Natural Resources Defense Council of California's experience, (*http://mlui.org/downloads/EECalifNRDC03-09-10.pdf*) released this March, indicates that state policies, enthusiastically backed by privately owned utilities, saved customers $5 billion in electricity costs in the past decade. Each dollar invested in efficiency by the utilities returned two dollars in savings or benefits. Significantly, the report also says that, even after three decades of wringing out inefficiencies, sizeable additional efficiency opportunities remain, and the utilities are pursuing them.

A very different example comes from Juneau, Alaska: When that town of 31,000 faced a natural disaster that sharply cut its electric supply, a major citizen mobilization cut electricity use by 40 percent within weeks. This hints at how quickly some demand reductions can occur in a highly motivated market.

A more salient model, however, is from the City of Ann Arbor's energy office. The pioneering office, in the past decade alone, saved that municipal government more than $6 million in tax dollars spent on energy costs.

Finally, Waverly, Iowa's municipal utility, which has less than 5,000 customers, managed over the past 19 years to avoid building a new generation plant thanks to its devotion to energy efficiency—even as the town's population grew by 10 percent. Waverly Light & Power employs two full-time energy-efficiency staff and are set to hire additional help for its seasonal home-energy tune-up program. The muni is considering a new, demand-side management program that will further reduce peak demand; officials say their best results stem from streetlight efficiency, proper sizing of air

conditioning equipment, and a new-buildings program that blunts the effect of its population growth. The utility says its efficiency work is very popular with local residents and Waverly's chamber of commerce.

Steps to Energy Efficiency

To drive an annual 2 percent efficiency increase, TCL&P should:

1. Establish a Regional Energy Office in league with other local governments and share its services with those municipalities. TCL&P will use its share to deal with the City, schools, large commercial customers, and least-efficient housing within its service area.
2. Decouple rates, i.e., establish a new rate structure that rewards the utility for providing more efficiency, not more electricity, to its customers. This strongly motivates utilities to effectively embrace efficiency. TCL&P can do this without state regulatory intervention because it is municipally owned.
3. Redirect most planned generation investments to efficiency investments in City facilities, large commercial customers, and least-efficient homes.
4. Establish a revolving loan fund dedicated to installing energy efficiency in typical homes and small businesses.
5. Hire a Community Outreach Officer to manage a high-profile public education campaign targeting those typical homes and businesses.
6. Work with the Michigan Land Use Institute and other groups supporting a public education campaign about the advantages of meeting this goal.

This campaign emphasizes the wider economic advantages of energy efficiency beyond saving customers money, including higher home or building values, increased local employment, and less need for costly new generating capacity. It uses interested community groups—from neighborhood organizations, to churches, to service organizations, to non-profits of all sorts—and supportive local media to spread the word and drive citizen involvement.

Part III: Feed-In Tariffs for Community-based Renewable Energy

Feed-In Tariffs are typically 20-year contracts providing profitable rates paid by utilities to people or organizations that invest in their own renewable energy sources and feed their power directly into the grid. By establishing feed-in tariffs for solar and wind power for a prioritized market, TCL&P greatly accelerates the build-out of localized renewable energy sources without investing its own capital. Over the life of the tariffs—30 years, because of the phase-in and phase-out of different contracts—the program has the potential to generate $114 million in new, gross income for participating local educational and non-profit institutions, private investment groups, and existing commercial enterprises.

Feed-In Tariffs have an impressive track record around the world, and, increasingly, in America. Currently, we are aware of 33 countries using FITs, and 19 states that are studying or starting to install the policy.

Feed-In Tariffs' Advantages

This has five significant advantages compared to other approaches to increasing renewable energy supplies.

First, schools, non-profits, private groups, and established companies with either large, in-town rooftops or open rural land can raise their own capital and take advantage of this solidly profitable entrepreneurial opportunity by installing either solar panel arrays or large wind turbines. This presents the wider community—particularly schools and non-profit organizations, who have priority access to this program—with opportunities to earn a fair, steady, 20-year return on investment.

Second, buying renewable power from this large cross-section of institutions, organizations, and companies can do wonders for the local economy. Dollars that once left the community and the state to purchase coal power recirculate within the region significantly longer.

Third, this program builds and spreads support for renewable energy among those not directly invested in the program, thanks to new construction and installation jobs it creates. The positive word of mouth about the profitability of these enterprises also highlights TCL&P's community-conscious approach.

Fourth, FITs eliminate TCL&P's need to raise its own investment capital for renewable energy projects. The groups using Feed-In Tariffs assemble the capital; history shows that once local financiers understand Feed-In Tariffs programs, they lend money. TCL&P can invest more of its own capital in its crucial efficiency projects.

Fifth, adaptation of Feed-In Tariffs by TCL&P will mark Traverse City as a forward-thinking community that embraces innovation—a surefire way to attract New Economy companies and workers who add greatly to the general prosperity. It will also establish a model for the surrounding region as word of its success spreads.

Specific Feed-In Tariff Goals

TCL&P can use Feed-in Tariffs to meet half of our 20 percent renewable energy goal from solar and from wind, exclusive of its contracts with Stony Corners Wind Farm and landfill gas operations.

This means contracting for an output equivalent to 66 large (50 kw) solar arrays placed on rooftops or marginal land. That will meet 1 percent of the utility's 2020 annual energy demand with renewable energy, and reduce demand for purchasing extra "peak" power from expensive "peaking" generators on hot, sunny days when air conditioners greatly drive up energy demand and solar panels are most productive.

School roofs are not only convenient places to install solar, they are excellent places to work such projects into curricula while providing new revenue for education.

Our plan also includes contracting for output equivalent to that from 10 large-scale (1.5 MW) wind turbines, necessarily located outside of the utility's service area. That is in addition to the Stony Corners turbines already under contract to TCL&P. Together, these turbines will meet 15 percent of the utility's annual energy demand by 2020.

Landfill gas supplies the remaining 4 percent of the 20 percent renewables goal, but is not part of the FIT program.

Feed-In Tariff Financial Outcomes

An appendix tallies the payout to community groups participating in a FIT and its overall effect on TCL&P's rates and monthly bills. Our calculations indicate that the slight, upward pressure from FITs on rates is more than compensated for in the downward pressure on bills due to energy efficiency.

Part IV: Biomass and Baseload

There may well be a "biomass rush" occurring in Northern Michigan: A number of companies and communities are either considering, planning, or already moving forward with the construction of new, biomass-fired power plants.

The forest industry is very interested in boosting demand for wood products, while the community is committed to containing demand to no more than a "sustainable" harvesting level, a phrase with a wide variety of meanings.

Regulated use of waste wood from Michigan's timber industry, including some use for energy supply, would add to the local economy. It creates jobs, pushes up some land values, helps reduce the export of energy (mostly coal) dollars, and keeps those energy dollars in local circulation.

The Institute is convinced that woody biomass is an acceptable way to help TCL&P step away from coal power and toward a clean-energy economy.

Protecting Our Forests

While many experts say that current timbering activities in Michigan's public and private forests can generate enough waste wood supply to continually feed several hundred megawatts of base load power, the Institute believes that an ongoing, statewide inventory that specifically demonstrates that claim is essential.

So is a control mechanism that determines when a supply/demand threshold has been crossed, either in a specific region or across the entire state.

But TCL&P does not have to wait for installation of these necessary regulations by the state. It should establish its own rigorous fuel-sourcing criteria, including a program that encourages growth of bio-fuel that grows well in poor soils—willow, poplar, switch grass, etc. In this way, TCL&P will provide a model program to the rest of the state.

TCLP's biomass project must include:

- A thorough, scientific, audited inventory of its proposed wood supply by independent, non-industry researchers.
- A legally binding agreement with the City of Traverse City regarding the sustainability of the supply and the growing and harvesting processes.
- Guarantees that the harvest of wood waste from designated forests leaves behind enough organic material to maintain or increase basic forest health.
- Full consideration of local economic impacts, particularly the effect on the price of wood products—especially pelletized fuel, particleboard, and other established industrial products.

- Avoidance of wood grown with artificial fertilizers. Using them means using oil, which degrades the closed carbon cycle that makes biomass "renewable."
- Limits on supplies to material harvested within 75 miles of the plant; long distance trucking also degrades the closed carbon cycle.
- Combined heat and power for nearby industry to offset the large carbon footprint and low energy density of wood.
- Boilers using state of the art gasification.
- A location that is properly cited and sized and supported by the community.

We also note that purchasing power from natural gas plants on a short- or long-term contract basis in Michigan may be an attractive option in terms of cost and carbon emissions, again as a "bridge" technology. There is a significant amount of idle natural gas power plant capacity in the state, and the state has large natural gas fields that new technology may soon unlock.

V. Conclusion

A ten-year plan that reaches 20 percent energy efficient and 20 percent fuel-free renewable energy by the year 2020 is the most cost effective, innovative, and environmentally sensible way to meet the needs of ratepayers and the community.

20-20 by 2020 not only achieves TCL&P's goal of 30 percent renewables by 2020, it surpasses it.

During TCL&P public forums, two resounding messages from local residents emerged.

First, we must immediately begin sharply cutting the amount of energy that we use, both on an individual and company basis, and make Traverse City an efficiency leader.

Second, there are still some questions that need to be answered about the consequences of using biomass as a fuel supply.

It is clear that citizens in Traverse City are very supportive of reducing energy demand and using wind and solar power. The company's surveys indicate that many people will pay more for electricity if they know it is clean and does no harm.

By showing marked progress in efficiency and clean renewables, TCL&P can demonstrate that biomass is an important part of a well-thought-out energy supply strategy and build strong citizen support for its overall decision-making process.

The challenge of replacing expiring coal contracts is both daunting and exciting. The public discourse about TCLP's direction is refreshing. We believe that the strategy outlined in this paper, which clearly requires a great deal more research and economic forecasting before it's an actual plan, can accomplish more for the local economy, ratepayers, and the environment than the company's admirable 30 by 2020 plan.

The Michigan Land Use Institute and Michigan Energy Alternatives Project look forward to a response to *20-20 by 2020* from TCL&P. We urge the company to identify areas of agreement, problems it spots in our facts or reasoning, and next steps it can take using either its own or outside resources. We stand ready to work closely with company officials, civic leaders, non-profit organizations, and local businesses to further research, refine, and then implement *20-20 by 2020*.

Appendix

By the Numbers: MLUI–MEAP 20-20 by 2020 Clean Energy Proposal Feed-In Tariff/Efficiency Spreadsheet Explanation

The spreadsheet accompanying *20-20 by 2020* contains four tables that, together, describe the effects of proposed Feed-In Tariff and efficiency programs on customer rates and the local economy.

Table A: This table describes how we propose to meet our program's 20 percent renewable energy goal using Feed-In Tariffs and the company's own planned renewable supplies, exclusive of biomass. Its also calculates the resulting overall renewable energy rates paid by the company to its renewables suppliers. It is based on annual Kwh demand figures slightly higher than those reported by TCL&P for 2009, and uses the rates the company intends to pay for its own contracted wind (Stony Corners) and landfill gas power.

The plan proposes contracting via Feed-In Tariffs with schools, community groups, and commercial interests for approximately 66 50-kw solar arrays over 10 years to provide 1 percent of TCLP's total sales, and the equivalent of 10 additional 1.5-megawatt wind turbines, also over 10 years, to provide an additional 9 percent. The Feed-In Tariff rates used were vetted by an international Feed-In Tariff expert and MPSC staff, and average 17.1 cents per Kwh. Together with the company's rate projections for its own wind and landfill gas contracts, the plan indicates a combined renewable energy rate of 13.5 cents/Kwh at full deployment of renewables (not counting biomass.)

At its peak, the Feed-In Tariffs program would pay approximately $5,710,950 per year to participants, all within the Grand Traverse region—with all solar coming from within the company's market, and all wind coming from surrounding rural areas.

Any economic impact from providing fuel to a biomass power plant would be over and above these projections.

Table B: This table looks more closely at the effect on the local economy of embracing Feed-In Tariffs for half of the renewable energy program we are proposing, exclusive of biomass. We assume that the program takes 10 years to reach full build-out, with Feed-In Tariffs based capacity growing by 10. Meanwhile, FIT revenue paid out to participants grows in the same stepwise fashion over ten years, and then levels out, stays constant for 10 years, and then phases out over the next 10 years. The total amount of rates paid into the local and regional community over 30 years, then, is $114,219,000.

Capital formation via local loans or other investment strategies used by schools, community groups, and commercial interests to build solar arrays or wind turbines totals $36,450,000. (Column G—Lines 8 and 9, multiplied by Column D, Lines 15 and 16)

Overall local economic activity over 30 years of solar and wind FITs becomes $150,309,000.

Table C: This table displays the effect that the FIT program has on average cost of generation over its ten-year build out. The 17.1 per Kwh overall FIT (solar and wind) rate is applied to 10 percent of company sales, while holding constant the other 90 percent at the company's current cost of generated power. The company's 2009 financials indicate that the company's current cost of generated power is 5.3 cents, and we use that figure for this 10-year calculation.

This table shows that, as Feed-In Tariffs are phased in over 10 years and replace 10 percent of "traditional" generation, the total cost of energy generation increases from the current 5.3 cents per Kwh to 6.5 cents per Kwh. However, it is crucial to note that it is standard practice to review FIT rates every few years and then lower them for the next batch of new, 20-year contracts, due to the steadily falling
cost of renewables.

Therefore, our calculations concerning the effect of FITs on customer rates is very conservative.

Table D: This table shows the relationship between the slight increases in generation cost that the FIT program creates and the customer savings created by a 20 percent increase in efficiency over 10 years.

The first of two examples shows what happens to a residential account consuming 512 Kwh per month; the second shows what happens to a commercial account consuming 3,906 Kwh per month.

Both examples show that, as usage drops due to efficiency and rates increase due to the FIT program, monthly bills remain essentially unchanged.

Conclusion: With *20-20 by 2020*, TCLP customers will see little change in their utility bills. At the same time, an estimated $150 million dollars in economic activity could occur in the local economy, a portion of it benefitting schools, non-profits, and residents in general. Because the FIT investments are so localized, money usually paid out to distant generating companies, coal concerns, and out-of-town investors stays in the local economy significantly longer.

This economic stimulus will also signal that northwest Lower Michigan and TCLP are leaders in creating a clean-energy economy that points Michigan toward renewed economic prosperity.

MLUI-MEAP 20-20 by 2020 Renewable Energy Plan

Table A — Feed-in Tariff program description

Assumptions:
Calculations based on annual sales figure of 333,000,000 kwhs
1.5MW turbine @23% capacity = 3,022,000kwh annual production — Installed cost est. $1.5 m per turbine
50kw solar array = 50,400 kwh annual production — Installed cost est $325 k per array
TCLP - Stoney Corners wind contract to receive 23,000,000 kwhs annual average
20% Renewables = 66,600,000 kwh

Energy source	percent of total kwhs	Kilowatt hours	# units		FIT rate	RE program cost		FIT Program cost
SOLAR	1%	3,330,000	66 50kw units		59 cents	1,964,700		1,964,700
WIND	9%	29,970,000	10 1.5MW units		12.5 cents	3,746,250		3,746,250
STONEY CORNERS	7%	23,310,000	contract		10.5 cents	2,447,550		
LANDFILL GAS	3%	9,990,000	contract		8 cents	799,200		
Total	20%	66,600,000			total annual cost	**8,957,700**		**5,710,950**
				Total RE rate	**13.5 cents**		FIT only rate	**17.1 cents**

Table B — Economic Impact of Feed-in Tariff Program on Local Economy

Assumptions:
FIT program build-out is 10% per year
FIT rates are fixed for 20 year contract length

	FIT rates Paid		FIT rates paid		
year 1	$571,095	year 21	$5,139,855		
year 2	$1,142,190	22	$4,568,760		
year 3	$1,713,285	23	$3,997,665		
year 4	$2,284,380	24	$3,426,570		
year 5	$2,855,475	25	$2,855,475		
year 6	$3,426,570	26	$2,284,380		
year 7	$3,997,665	27	$1,713,285		
year 8	$4,568,760	28	$1,142,190		
year 9	$5,139,855	29	$571,095	**Total capitol creation**	
year 10	$5,710,950			21,450,000	solar
year 11-20	$57,109,500			15,000,000	wind
total	**$88,519,725**		**$25,699,275**	**$36,450,000**	

Conclusion: Estimated local economic impact of FIT program **$150,309,000**

Table C — Effect of FIT program on average cost of generation

Assumptions:
The wholesale cost of traditional generation does not change over 10 year period
The FIT program develops at a rate of 10% per year
The average FIT rate does not change during this period
Total KWHS sold does not change over the 10 year period
Generation Rate determined from TCLP 2009 Financial Stmt. $16,864,472 divided by 315,000,000 kwhs

year #	FIT gen. kwhs	FIT rate	FIT Cost	Reg. gen kwhs	Reg rate	Reg Cost	total cost	**Average kwh cost**
1	3,330,000	0.171	$569,430	312,655,626	0.053	$16,570,748	$17,140,178	**0.054**
2	6,660,000	0.171	$1,138,860	309,325,626	0.053	$16,394,258	$17,533,118	**0.055**
3	9,990,000	0.171	$1,708,290	305,995,626	0.053	$16,217,768	$17,926,058	**0.056**
4	13,320,000	0.171	$2,277,720	302,665,626	0.053	$16,041,278	$18,318,998	**0.057**
5	16,650,000	0.171	$2,847,150	299,335,626	0.053	$15,864,788	$18,711,938	**0.059**
6	19,980,000	0.171	$3,416,580	296,005,000	0.053	$15,688,265	$19,104,845	**0.06**
7	23,310,000	0.171	$3,986,010	292,675,626	0.053	$15,511,808	$19,497,818	**0.061**
8	26,640,000	0.171	$4,555,440	289,345,626	0.053	$15,335,318	$19,890,758	**0.062**
9	29,970,000	0.171	$5,124,870	286,015,626	0.053	$15,158,828	$20,283,698	**0.064**
10	33,300,000	0.171	$5,694,300	282,685,626	0.053	$14,982,338	$20,676,638	**0.065**

Conclusion: FIT increases overall pkw cost by 1.1 cent over ten year development period .054 - .065

Table D — Effect of FIT rate increase and Energy Efficiency Goal of 2% reduction per year on average customer

Assumptions:
Energy Efficiency Campaign results in 2% savings per year during 10 year period
Increased average weighted cost of power from Table C is factored in
Rate amounts are representitive, more data is required for more precise predictions per rate class

year #	Residential av. Useage	av kwh cost	total billing	year #	Commercial av useage	cost per	total billing
1	512 kwh	0.054	**$27.64**	1	3906 kwh	0.054	**$210.92**
2	501 kwh	0.055	$27.59	2	3827 kwh	0.055	$210.53
3	491 kwh	0.056	$27.49	3	3750 kwh	0.056	$210.02
4	481 kwh	0.057	$27.42	4	3675 kwh	0.057	$209.47
5	471 kwh	0.059	$27.81	5	3601 kwh	0.059	$212.45
6	461 kwh	0.06	$27.69	6	3528 kwh	0.06	$211.73
7	451 kwh	0.061	$27.55	7	3457 kwh	0.061	$210.90
8	442 kwh	0.062	$27.40	8	3387 kwh	0.062	$210.04
9	433 kwh	0.064	$27.72	9	3319 kwh	0.064	$212.43
10	424 kwh	0.065	**$27.58**	10	3252 kwh	0.065	**$211.42**

Conclusion: FIT rate increase in combination with EE goal attainment has little effect on overall cost to rate-payer