ATC Energy Collaborative - Michigan Progress Update

UP Transmission Business Briefing

October 29, 2008

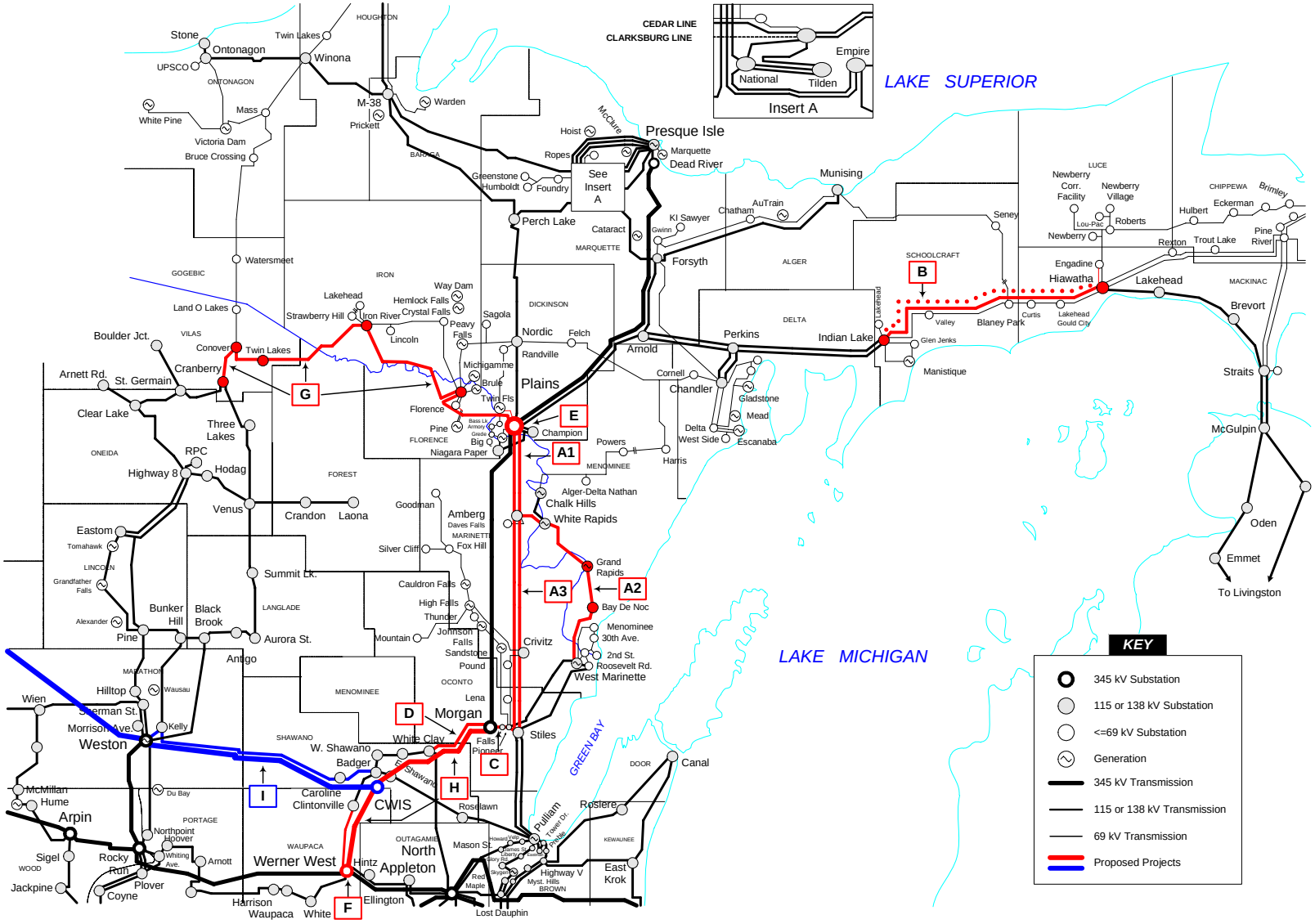
Agenda

- Collaborative Objectives, Deliverables, Approach
- Background and Progress to Date
  - Upper Peninsula Situation Review
  - Strategic Flexibility Introduction
    - Concepts
    - ATC Corporate Futures
- Preliminary Futures for the UP Analysis
  - Draft micro drivers and micro driver bounds
  - Identify behavior of micro drivers within ATC futures
  - Stakeholder Feedback Process
- Overall Timeline
- Next Steps

ATC Energy Collaborative - Michigan Objective, Deliverables and Approach

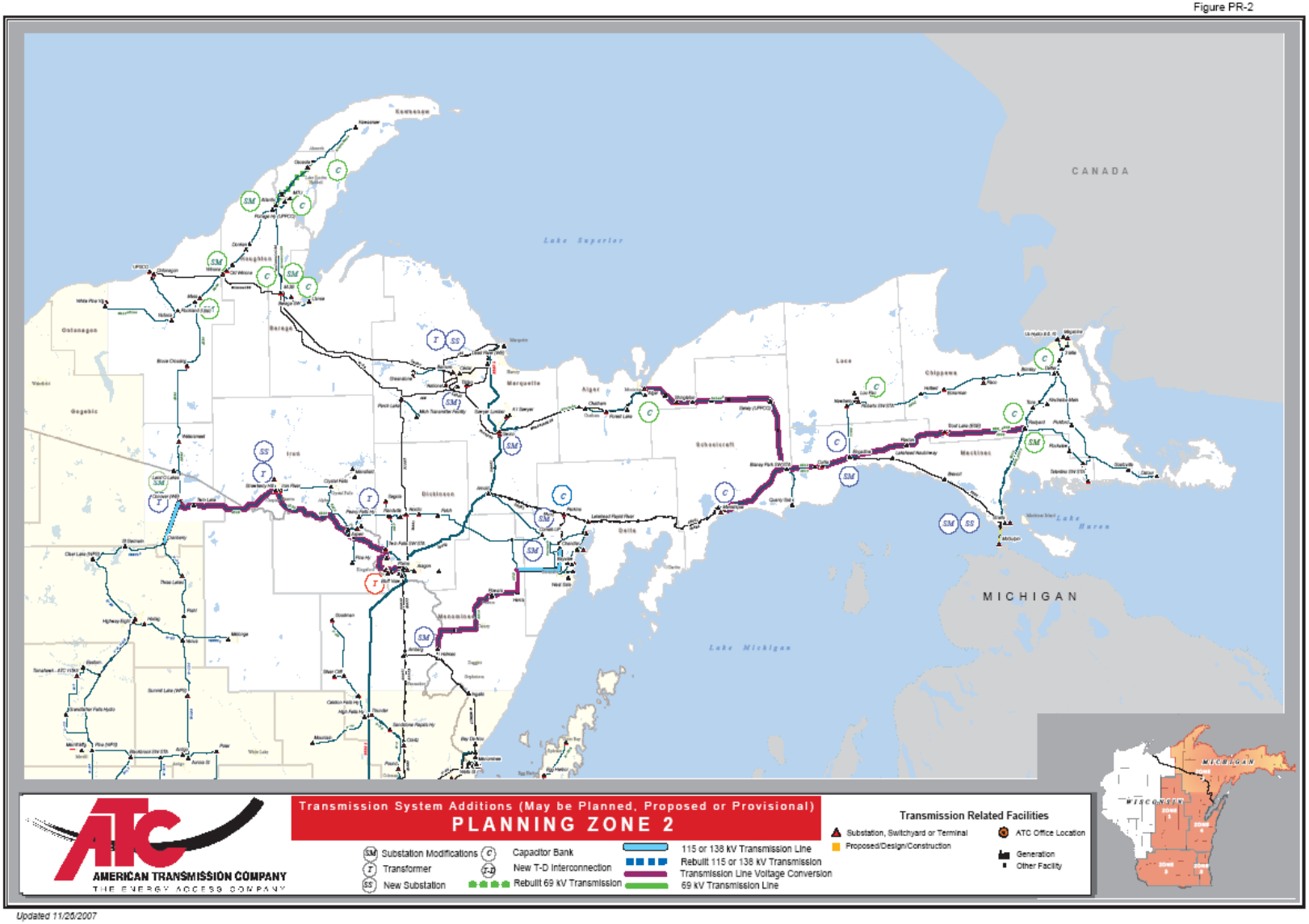
- Objective
  - To evaluate needs of Upper Peninsula using strategic flexibility approach and considering:
    - "Plausible Futures" in the Upper Peninsula
    - Range of alternative options available
    - Risks associated with options
- Deliverables
  - Plan for Upper Peninsula that meets the intermediate and long term needs of the area with an understanding of the range of plausible futures and risk created by those futures
- Approach
  - Work closely with stakeholders to customize ATC corporate futures for UP, brainstorm alternatives, evaluate alternatives with reliability and economic models as appropriate, make recommendations for overall solutions

Upper Peninsula Situation Review
Existing Projects



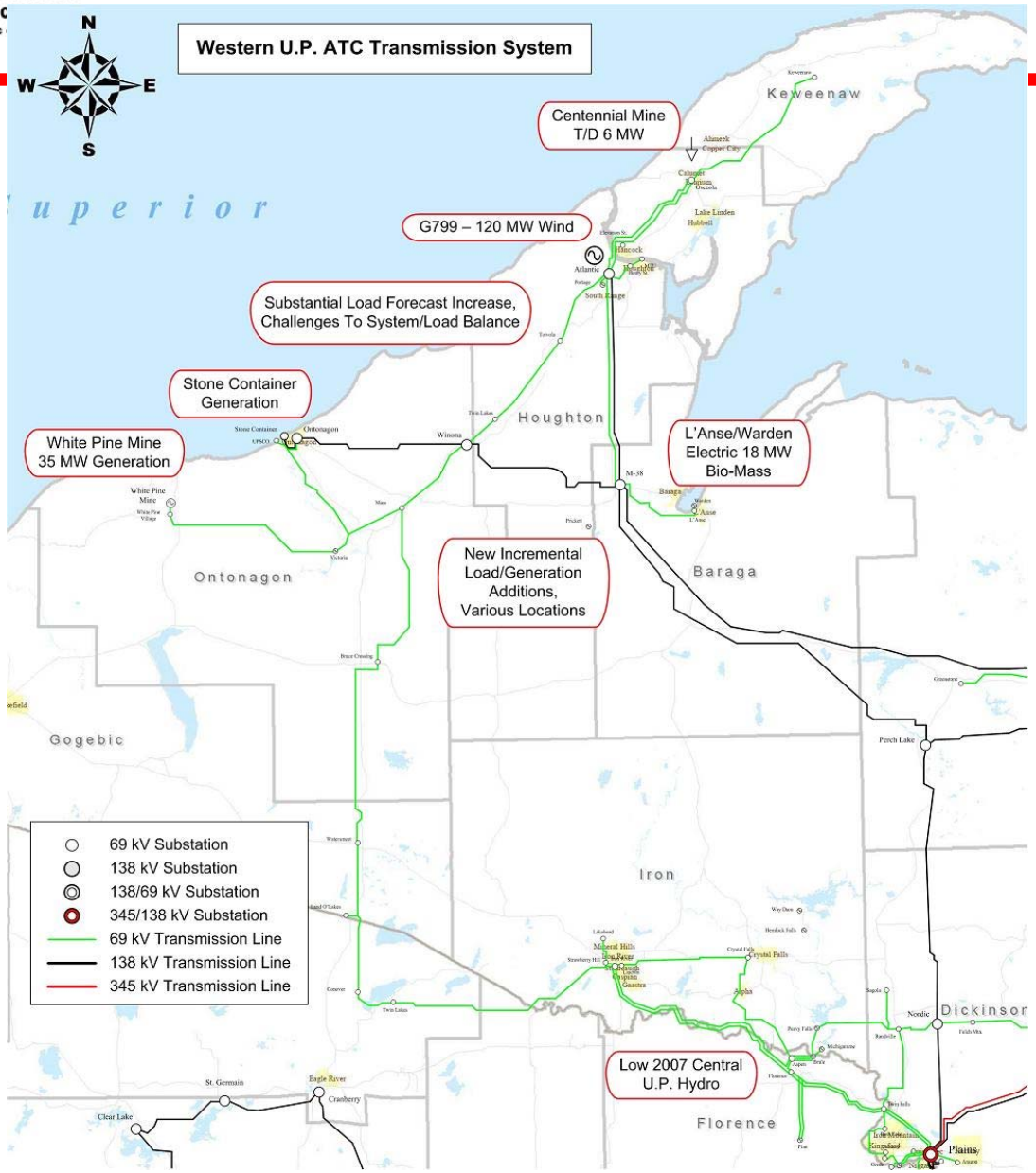
Upper Peninsula Situation Review
Existing Projects (cont)

Figure PR-2

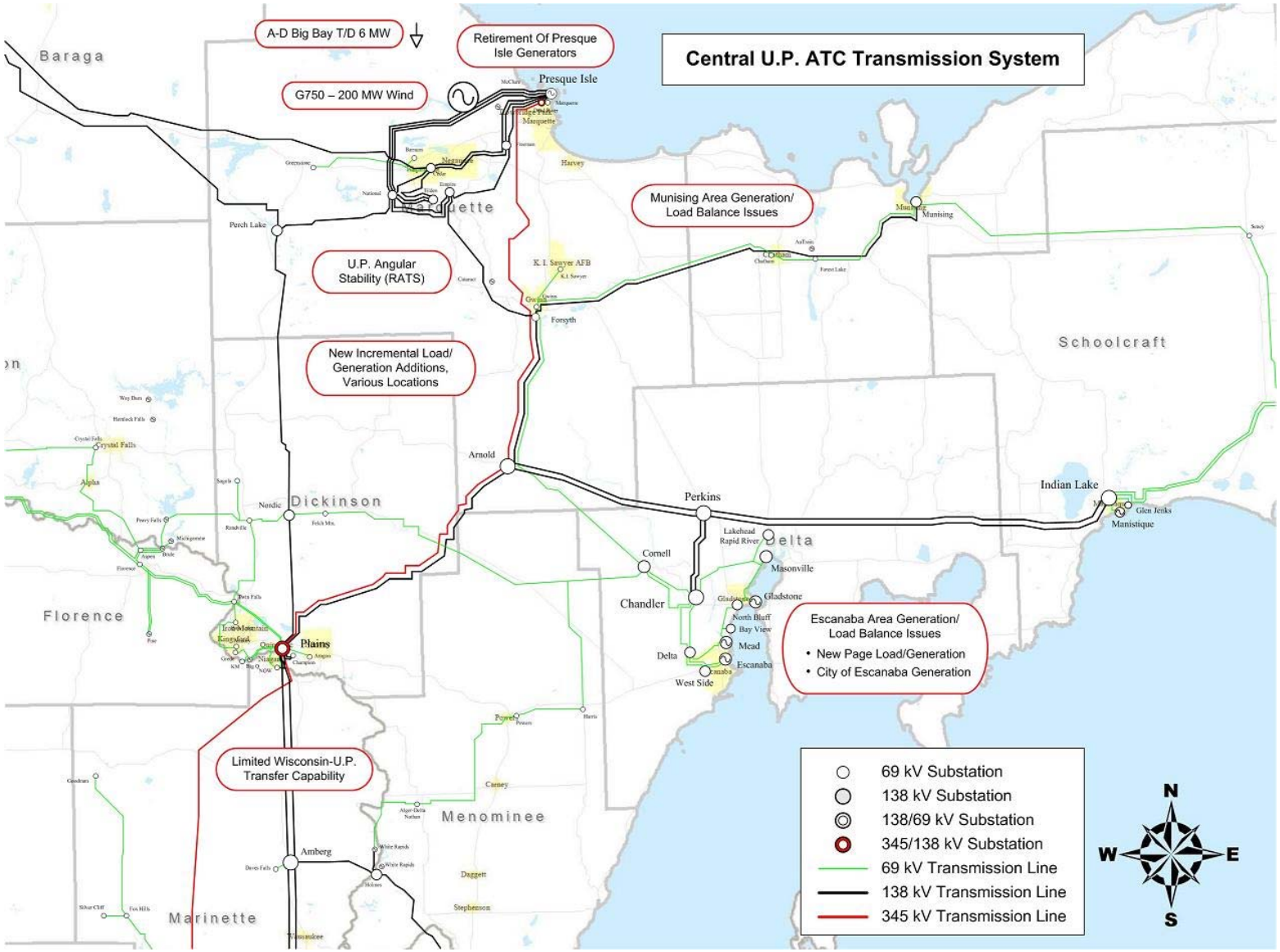


Updated 11/26/2007

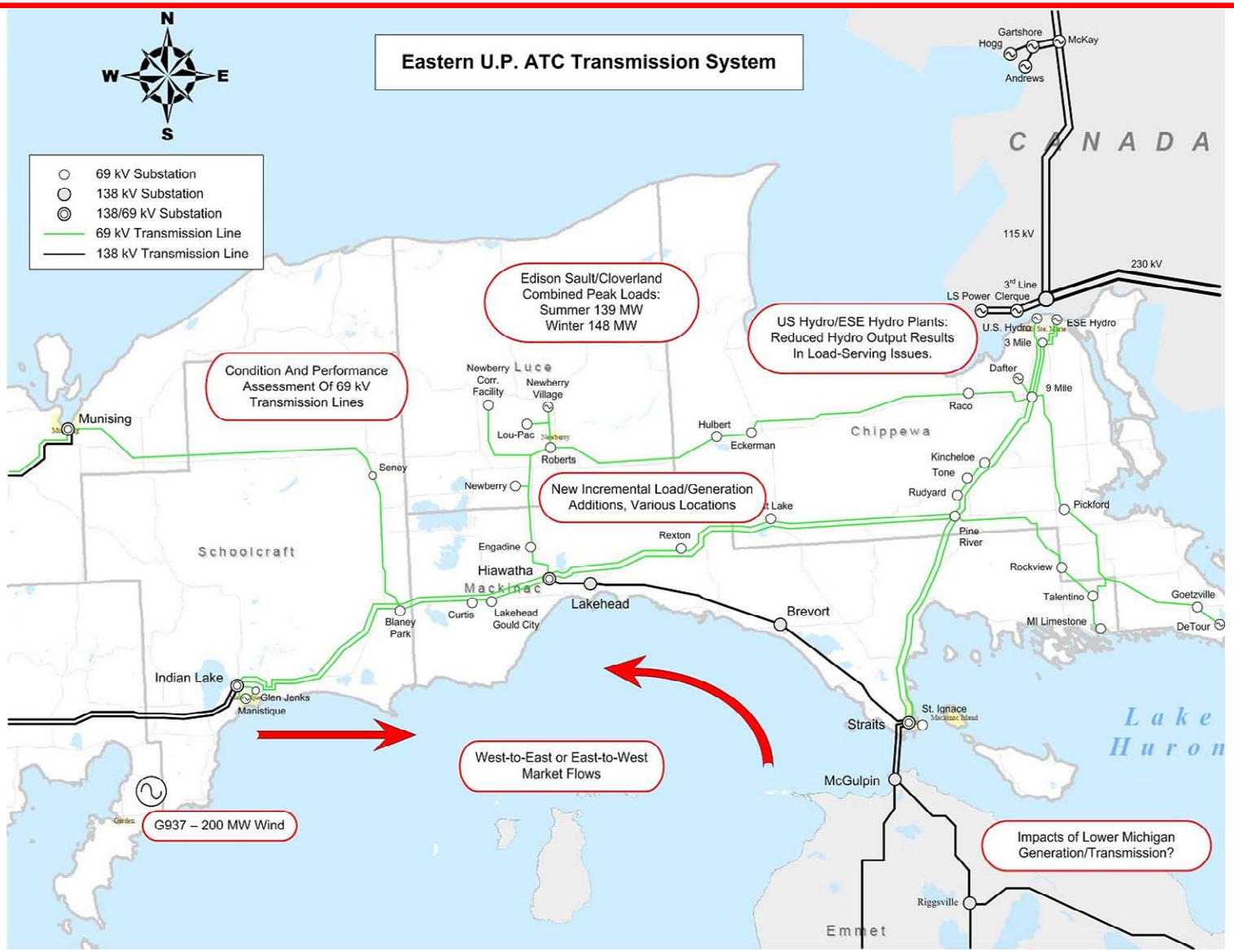
Upper Peninsula Situation Review
Western UP



Upper Peninsula Situation Review
Central UP

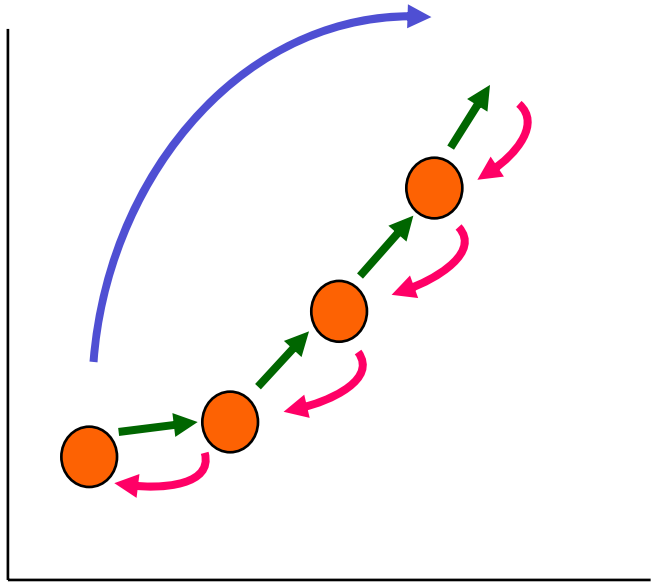


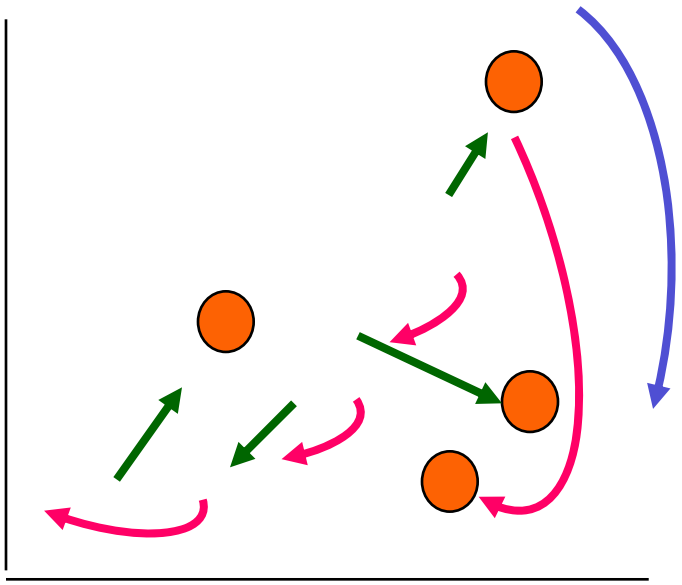
Upper Peninsula Situation Review
Eastern UP



Why Strategic Flexibility?

Traditional Planning Process





Traditional strategic planning depends on linkages between actions and outcomes

Unexpected events undermine the best strategic plan by corrupting assumed connections

The Problem with Prediction-Based Strategy

- Traditional strategic planning requires accurate predictions of the future, but these predictions can be unreliable
  - So you'd like to remain flexible BUT
- Utilities are large complex businesses
  - Need to make complex decisions
  - Need to make large capital investments over long periods of time

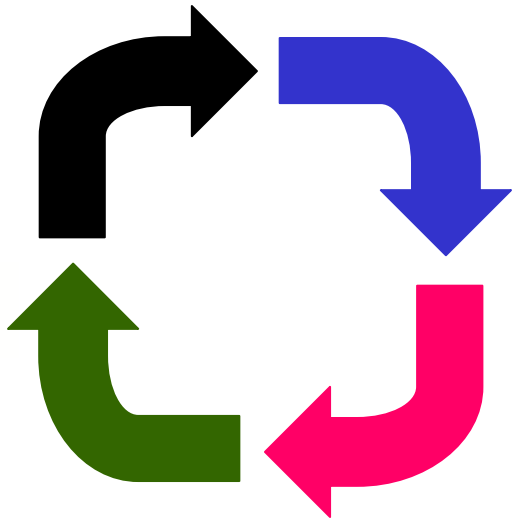
The Strategic Flexibility framework

Anticipate

- Identify drivers of change
- Define the range of possible futures
- "Scenario building"

Formulate

- Develop an optimal strategy for each scenario
- Compare optimal strategies to define "core" and "contingent" elements



Operate

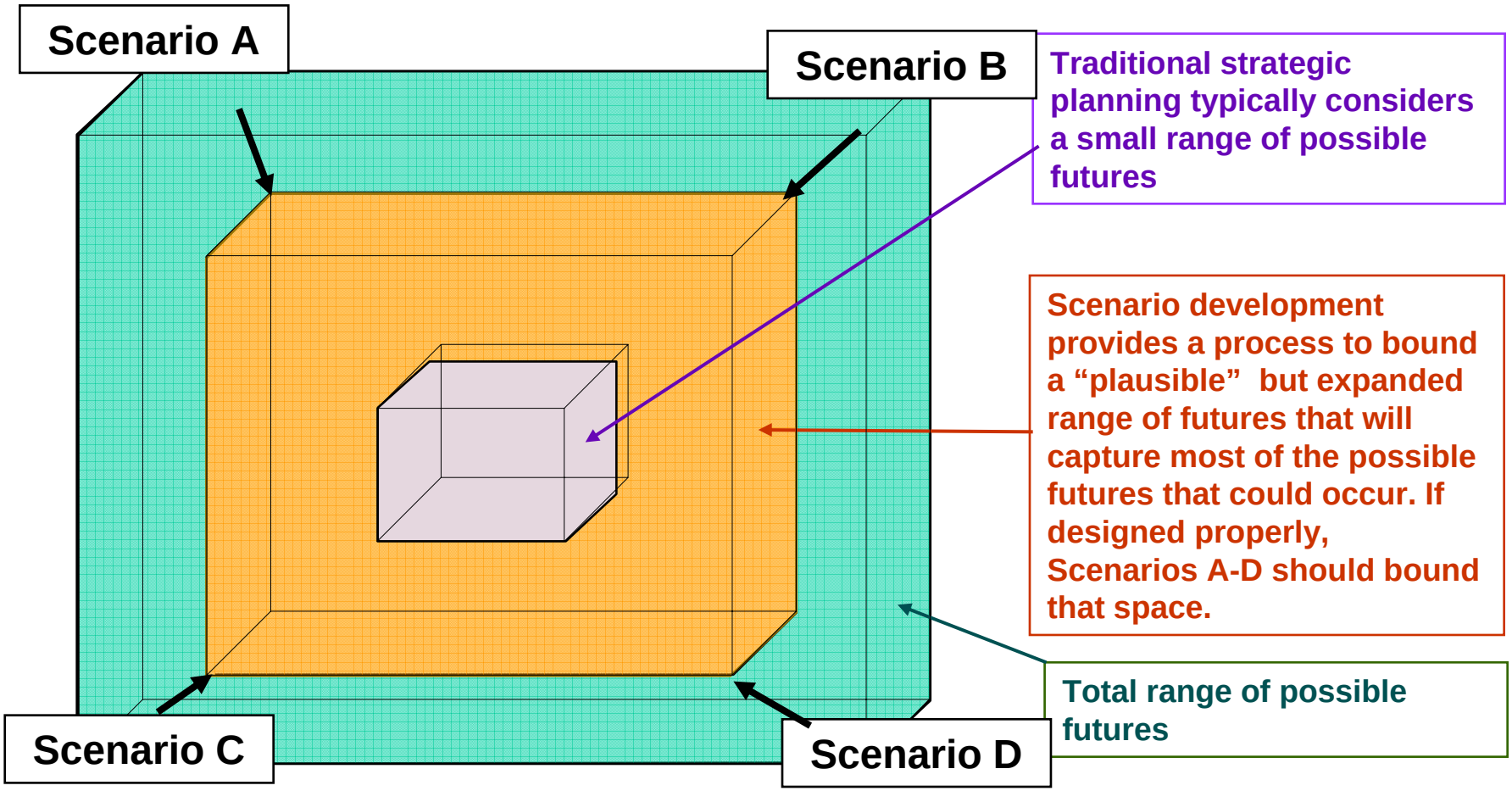
- Implement the core strategy
- Monitor the environment
- Exercise or abandon options as appropriate

Accumulate

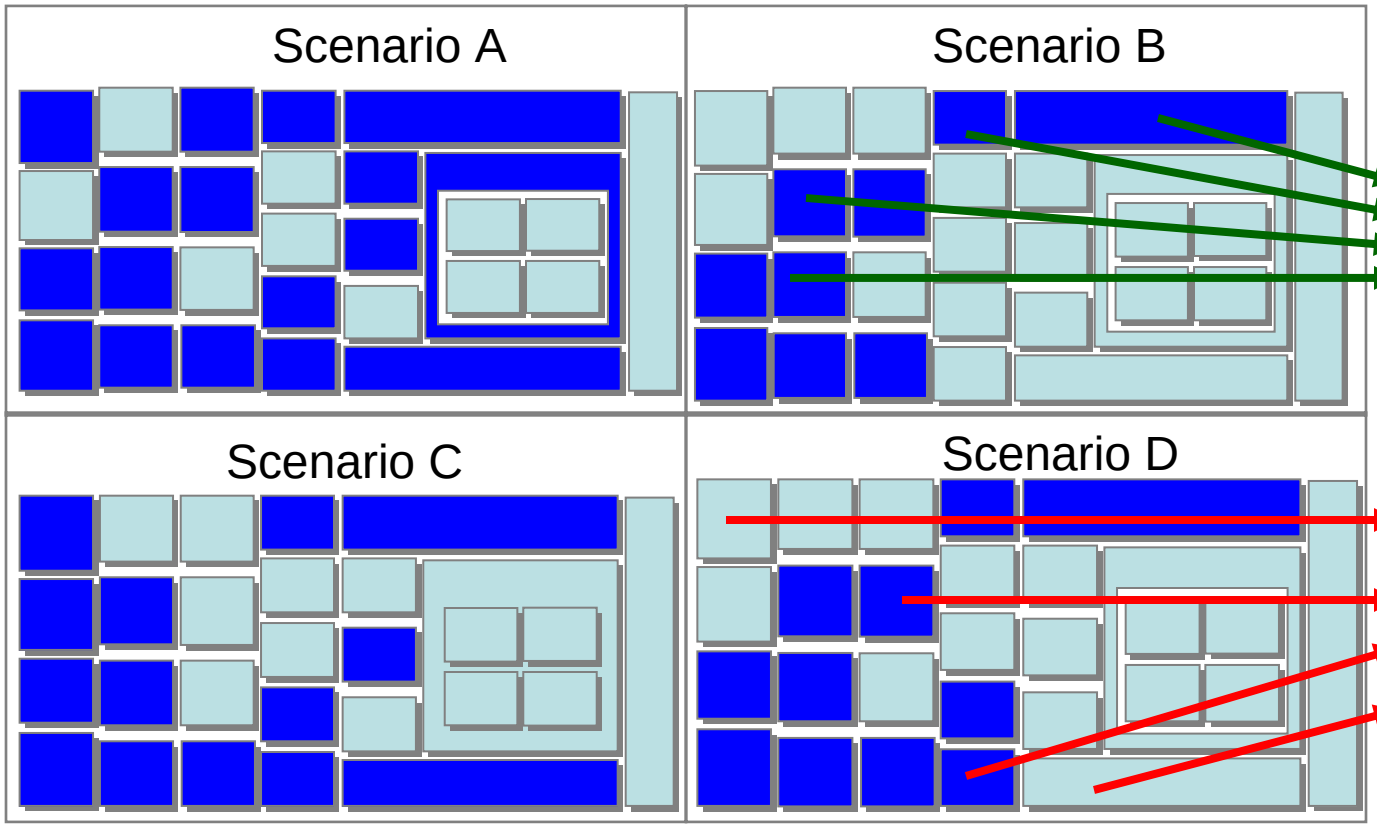
- Acquire those capabilities needed to implement the core strategy
- Take real options on capabilities needed for contingent strategies

Prepare for a future you cannot predict.

Anticipate the Future by Bounding It



"Core" and "Contingent" Strategic Options



- ***"Core" elements of the plan***
- ***"Contingent" elements of the plan***

Needed project

Unneeded project

Source: Deloitte Consulting

Strategic Analysis Approach
Strategic Flexibility

1. **Review ATC Corporate Futures**
2. **Customize the futures for UP**
    1. **Brainstorm UP-specific drivers for futures**
    2. **Set bounds for UP-specific drivers**
    3. **Determine behavior of UP-specific drivers in ATC corporate futures**
3. **Identify needs created by each future**
    1. **Reliability analysis**
    2. **Economic benefit/cost analysis if appropriate**
    3. **Review needs with stakeholders; brainstorm solutions**
4. **Evaluate performance of solutions in each future**
5. **Review results with stakeholders**
    1. **Identify solutions that work in all futures – prepare to implement**
    2. **Identify solutions that work in some futures – develop real options that can be exercised if solution is needed**
    3. **Identify solutions that don't work in any future - abandon**
6. **Present recommendations to ATC executives**

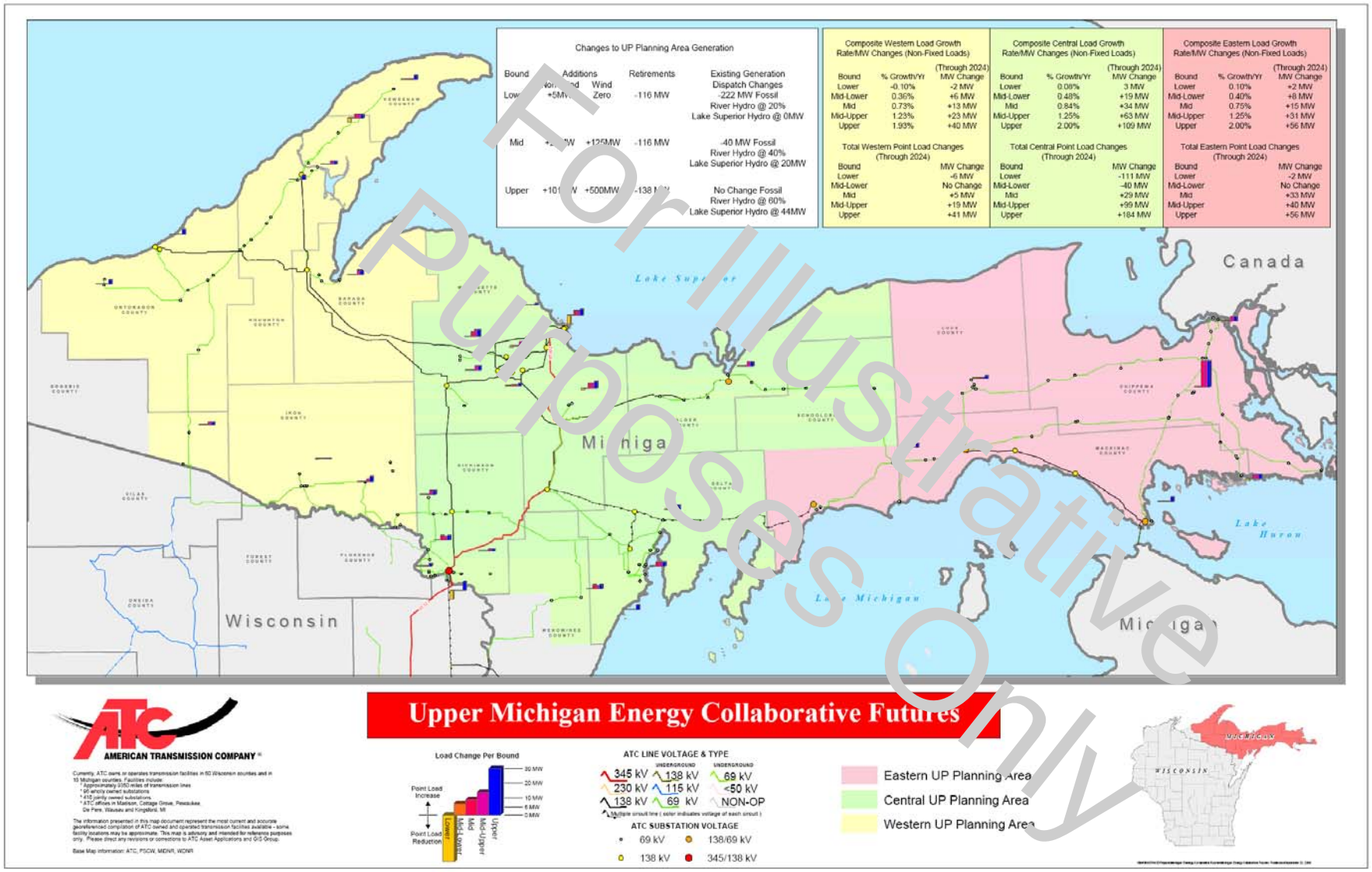
ATC Initial Stakeholder Process

- May 2008 through October 2008
  - 16 Meetings and Briefings
  - More than 25 Stakeholders involved
- Developed ATC's Matrix of Drivers
  - Discussion of the "Plausible Bounds"
  - Upper, Mid and Lower for Each Driver

Michigan Micro-Drivers

- Load Assumptions
  - Demand and Energy Growth
  - Point Load Step Changes
- Generation Assumptions
  - Consider all sources
    - IOU/Co-Op/ Municipal Owned
    - End-use customer owned (Behind the meter)
  - Existing Local Generation Availability (Hydro, CTs, diesels)
  - New Additions
  - Retirements

Preliminary UP Drivers & Futures Geographic View



Preliminary UP Drivers & Futures Spreadsheet View

ATC Futures - ATC Energy Collaborative - Michigan

October 23, 2008 (Draft)

Load Assumptions													Generation Assumptions											
Demand Growth Within UP (Demand MWs)			Energy Growth Within UP (Energy MWHrs)			Total Point Loads MW added in the UP (2018/2024)			Total UP Growth (2018)	Total UP Growth (2024)	Demand Growth Outside UP (MWs)		Existing UP Generation Profile (Changes in Dispatch Characteristics)			UP Generation Additions			UP Generation retirements			Wind Generation			New Generation in Northern Lower Michigan
West	Central	East	West	Central	East	West	Central	East	U	U.P.			West	Central	East	West	Central	East	West	Central	East	West	Central	East	
						(-6 / 0)	(-111 / 0)	(-2 / 0)					-51 MW	-71 MW				5 MW		116 MW					
-0.10%	0.08%	0.10%	-0.10%	0.08%	0.10%	-6 MW	-111 MW	-2 MW	-1.44%	-0.86%	0.5%		Hydro 20% of max	Hydro 20% of max	0MW Hydro + 11.4MW Diesel	None	None		None		None	Zero	Zero	Zero	Zero
							(-40 / 0)						-40 MW	-71 MW											
0.36%	0.48%	0.40%	0.36%	0.48%	0.40%	N[illegible]nge	-40 MW	No Change	-0.[illegible]1%	-0.[illegible]	[illegible]		Hydro 20% of max	Hydro 20% of max											
						+5 /	(+29 / 0)	(+33 / 0)					Hydro 40% max	-40 MW				29 MW		116 MW					
0.73%	0.84%	0.75%	0.73%	0.84%	[illegible]%	5 MW	29 MW	+33 MW	1.14%	0.84%	1.75%			Hyd[illegible]0% of max	20MW Hydro	None	None		None		None	25MW	50MW	50MW	100MW
						(+ | +79 / +20)	(+35 / +5)																	
1.23%	1.25%	1.25%	1.23%	1.25%	1.25%	+19 MW	+99 MW	[illegible] MW	2.00%	1.60%	2.0%				32MW Hydro				None						
						(+19 / +2	(+134 /+5	46 / +1										101 MW		138 MW					
1.93%	2.00%	2.00%	1.93%	2.00%	2.00%	+41 MW	+184 MW	+56 MW	[illegible]0%	2[illegible]%	3.0%		Hydro 60% of max	Hydro [illegible]% of [illegible]	44[illegible] Hydro	None	None		None		None	100MW	200MW	200MW	600MW

(+1.93%)	(+2.00%)	(+2.00%)	(+1.93%)	(+2.00%)	(+2.00%)	(+19 MW)	(+134 MW)	(+46 MW)	(+3.00%)							(none)	(none)	(+101 MW)	(none)	(-116 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	
Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper		Upper	Upper	Upper	Mid	Upper	Upper	Upper	Upper	Lower	Lower	Lower	Mid	Mid	Mid	Upper 600MW
(+0.73%)	(+0.84%)	(+0.75%)	(+0.73%)	(+0.84%)	(+0.75%)	(+5 MW)	(+29 MW)	(+33 MW)	(+1.14%)							(none)	(none)	(+[illegible] MW)	(none)	(-138 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	
Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid		Mid 1.75%	Lower	Lower	Mid-Upper	Lower	Lower	Lower	Upper	Upper	Upper	Upper	Mid	Mid	Mid	Upper 600MW
(+0.36%)	(+0.48%)	(+0.40%)	(+0.36%)	(+0.48%)	(+0.40%)	(no change)	(-40 MW)	(no change)	(-0.24%)							(none)	(none)	(-[illegible] MW)	(none)	(-116 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	
Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower		Mid-Lo[illegible] 1%	M[illegible]ower	Mid-[illegible]wer	Mid	Lower	Lower	Lower	Low[illegible]	Mi[illegible]	Mid	Mid-Upper	Upper	Upper	Upper	Lower 0
(-0.10%)	(+0.08%)	(+0.10%)	(-0.10%)	(+0.08%)	(+0.10%)	(-6 MW)	(-111 MW)	(-2 MW)	(-1.44%)							(none)	(none)	(-[illegible])	(none)	(-116MW)	(none)	(none)	(none)	(none)	
Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower		Lower 0.5%	Mid	[illegible]	Upper	Mid	Mid	Mid	L[illegible]	Mid	Mid	Mid	Lower	Lower	Lower	Lower 0
(+1.23%)	(+1.25%)	(+1.25%)	(+1.23%)	(+1.25%)	(+1.25%)	(+16 MW)	(+79 MW)	(+35 MW)	(+2.00%)							(none)	(none)	(+[illegible] MW)	(none)	(-[illegible]8 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	
Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper		Mid-Upper 2%	Lower	L[illegible]wer	Mid	Lower	Lower	Lower	Mid	Upper	Upper	Upper	Upper	Upper	Upper	Mid 100MW
(+0.36%)	(+0.48%)	(+0.40%)	(+0.36%)	(+0.48%)	(+0.40%)	(no change)	(-40 MW)	(no change)	(-0.24%)							(none)	(none)	(+5 MW)	(none)	(-116 M[illegible]	(none)	(none)	(none)	(none)	
Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower		Mid-Lower 1.3%	Mid	Mid	Lower	[illegible]	[illegible]	Lower	Mid	Mid	[illegible]	[illegible]	Lower	Lower	Lower	Lower 0

(+1.93%)	(+2.00%)	(+2.00%)	(+1.93%)	(+2.00%)	(+2.00%)	(+41 MW)	(+184 MW)	(+56 MW)		(+2.58%)						(none)	(none)	(+101 MW)	(none)	(-116 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	
Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper		Upper	Upper 3%	Upper	Upper	Mid	Upper	Upper	Upper	Upper	Lower	Lower	Lower	Mid	Mid	Mid	Upper 600MW
(+0.73%)	(+0.84%)	(+0.75%)	(+0.73%)	(+0.84%)	(+0.75%)	(+5 MW)	(+29 MW)	(+33 MW)		(+0.84%)						(none)	(none)	(+[illegible] MW)	(none)	(-138 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	
Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid		Mid	Mid 1.75%	Lower	Lower	Mid-Upper	Lower	Lower	Upper	Upper	Upper	Upper	Upper	Mid	Mid	Mid	Upper 600MW
(+0.36%)	(+0.48%)	(+0.40%)	(+0.36%)	(+0.48%)	(+0.40%)	(no change)	(-40 MW)	(no change)		(-0.05%)						(none)	(none)	(+5 MW)	(none)	(-116 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	
Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower		Mid-Lower	Mid-Low 1%	Lower	Mid-Lower	Mid	Lower	Lower	Lower	Low[illegible]	M[illegible]	Mid	Mid-Upper	Upper	Upper	Upper	Lower 0
(-0.10%)	(+0.08%)	(+0.10%)	(-0.10%)	(+0.08%)	(+0.10%)	(-6 MW)	(-111 MW)	(-2 MW)		(-0.86%)						(none)	(none)	(+5[illegible])	[illegible]one)	(-116 MW)	(none)	(none)	(none)	(none)	
Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower		Lower	Lower 0.5%	Mid	Mid	Upper	Mid	Mid	Lower	Mid	Mid	Mid	Mid	Lower	Lower	Lower	Lower 0
(+1.23%)	(+1.25%)	(+1.25%)	(+1.23%)	(+1.25%)	(+1.25%)	(+19 MW)	(+99 MW)	(+40 MW)		(+1.60%)						(none)	(none)	(+29 MW)	(none)	[illegible]	(none)	(+100 MW)	(+200 MW)	(+200 MW)	
Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper		Mid-Upper	Mid-Upper 2%	Lower	Lower	Mid	Lower	Lower	Lower	Mid	Up[illegible]	Upper	Upper	Upper	Upper	Upper	Mid 100MW
(+0.36%)	(+0.48%)	(+0.40%)	(+0.36%)	(+0.48%)	(+0.40%)	(no change)	(-40 MW)	(no change)		(-0.05%)						(none)	(none)	(+5 MW)	(none)	(-116 MW)	(none)	(none)	(none)	(none)	
Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower		Mid-Lower	Mid-Lower 1.3%	Mid-Lower	Mid	Lower	Mid	Mid	Lower	Mid	Mid	Mid	Mid	Lower	Lower	Lower	Lower 0

ATC Futures (Text View)
Robust Economy

Peak Growth Inside ATC	3% (Upper)
Energy Growth Inside ATC	3% (Upper)
Peak Growth Outside ATC	3% (Upper)
Energy Growth Outside ATC	3% (Upper)
Generation Inside ATC	Upper (see notes)
Generation Outside ATC	MISO's Reference
RPS % Inside ATC	Mid (8% in 2013)
Renewable Source for ATC	Mid
General Environ Regs	Mid
Natural Gas Prices	Mid-Upper (+25%)
Coal Prices	Upper (20%)

- ATC footprint energy and peak demand grow at a fast rate (above the rate over the past 5 years) because of a fast growing economy.
- Add UP Load Drivers
- To help keep up with growing demand, 500 MW of coal-fired units are added within the ATC footprint in 2018 and 2024, respectively. These units could include provisions for carbon sequestration assuming that a $25/ton CO2 tax makes it cost-effective to do so. Nelson Dewey, a new 280 MW coal-fired generator under PSC review, also helps to meet the higher demand levels. There are no generation retirements within the ATC footprint, other than those that have been announced. The generation expansion plans both inside and outside of ATC come from MISO's Reference Future. However, plant capacities are scaled up on new units to serve the higher peak demand and maintain 15% reserve margins.
- Add UP Generation Drivers
- The percent of energy in ATC from renewables in 2018 and 2024 is 15%, which is higher than required by current Wisconsin Renewable Portfolio Standard (RPS) standards (i.e., 10% by 2015). The Governor's Task Force on Global Warming has suggested that the RPS standard be increased from its current level. A robust economy could help encourage greater investment in renewable resources, even if their direct costs were somewhat higher. A $25/ton CO2 tax is imposed and mercury costs are 25% higher.
- The combination of a $25/ton CO2 tax, 25% higher mercury costs and higher energy requirements results in higher demand and costs for natural gas. There is also upward pressure on coal costs because of high energy requirements.

ATC Futures (Text View)
High Retirements

Peak Growth Inside ATC	1.5% (Mid)
Energy Growth Inside ATC	1.5% (Mid)
Peak Growth Outside ATC	1.5% (Mid)
Energy Growth Outside ATC	1.5% (Mid)
Generation Inside ATC	Lower (see notes)
Generation Outside ATC	MISO's Reference
RPS % Inside ATC	Mid (8% in 2013)
Renewable Source for ATC	Mid
General Environ Regs	Mid
Natural Gas Prices	Mid-Low (-20%)
Coal Prices	Mid

- ATC footprint energy and peak demand grow at a rate similar to that over the past five years.
- Add UP Load Drivers
- The combination of a $25/ton CO2 tax and 25% higher mercury costs plus the high (and potentially increasing) cost of retrofitting coal-fired plants to meet Federal Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule (CAMR) regulations cause smaller aging coal-fired units within the ATC footprint to be retired for economic reasons (270 MW in 2013, 880 MW in 2018 and 2024). Nelson Dewey, a new 280 MW coal-fired generator under PSC review, helps to meet internal demand no longer met by retired units. The generation expansion plans both inside and outside of ATC come from MISO's Reference Future.
- Add UP Generation Drivers
- The percent of energy in ATC from renewables in 2018 and 2024 is 15%, which is higher than required by current Wisconsin RPS standards (i.e., 10% by 2015). Additional wind power could help replace the loss of local, relatively low energy cost generation due to the retirement of smaller and aging coal-fired units, especially if wind-power tax incentives continue. A $25/ton CO2 tax is imposed and mercury costs are higher.
- Additional wind power and higher building standards (requiring better insulation, windows, furnaces, air conditioning, etc.) could also help temper demand for natural gas, somewhat reducing costs from historically high levels. Coal prices – MISO MAIN $2/MMBTU – delivered in 2010 and 2%/yr ($2.34 in 2018 and $2.59 in 2024)

ATC Futures (Text View)
High Environmental

Peak Growth Inside ATC	Lower-Mid
Energy Growth Inside ATC	Lower-Mid
Peak Growth Outside ATC	Lower-Mid
Energy Growth Outside ATC	Lower-Mid
Generation Inside ATC	Lower
Generation Outside ATC	MISO's Environmental
RPS % Inside ATC	10% and 20%
Renewable Source for ATC	Mid
General Environ Regs	Upper
Natural Gas Prices	Upper (50%)
Coal Prices	Lower (-10%)

- Load growth within ATC (2013 =1.2%, 2018 and 2024= 1.0%)
- Energy growth within ATC (2013 =1.2%, 2018 and 2024=0.8%)
- Load Growth outside ATC(2013 =1.2%, 2018 and 2024 =1.1%).
- Energy growth outside ATC (2013=1.2%, 2018 and 2024 =1.1%
- Increased conservation programs help reduce ATC footprint energy and peak demand growth rates below the most recent 5-year rate. These rates decline further in 2018 as conservation programs ramp up, particularly in WI. The WI Governor's Task Force on Global Warming has proposed conservation programs that have a greater impact on energy than peak demand growth. As a result, the reduction in energy growth rate is somewhat greater than the peak demand rate.
- Add UP Load Drivers

- The combination of a $44/ton CO2 tax and 25% higher mercury costs plus the high (and potentially increasing) cost of retrofitting coal-fired plants to meet CAIR and CAMR regulations cause smaller, aging and less efficient coal-fired units to be retired within the ATC footprint ((270 MW in 2013, 880 MW in 2018 and 2024). The generation expansion plans both inside and outside of ATC come from MISO's Environmental Future
- Add UP Generation Drivers

- The percent of energy in ATC from renewables in 2013 is 10%, and 20% in 2018 and 2024, which is higher than required by current Wisconsin RPS standards (10% by 2015). Additional wind power could help replace retired coal fired units, especially if wind-power tax incentives continue or are increased.

- The higher CO2 tax encourages greater use of natural gas and less use of coal, which puts increasing and decreasing pressure on the cost of these fuels, respectively. Additional wind power could result in more frequent dispatch of fast-start natural gas-fired combustion turbines due to the variability of wind. This could also cause some upward pressure on natural gas costs.

ATC Futures (Text View)
Slow Growth

Peak Growth Inside ATC	Lower (0.5%)
Energy Growth Inside ATC	Lower (0.5%)
Peak Growth Outside ATC	Lower (0.5%)
Energy Growth Outside ATC	Lower (0.5%)
Generation Inside ATC	Mid
Generation Outside ATC	MISO's Reference
RPS % Inside ATC	Lower
Renewable Source for ATC	Mid
General Environ Regs	Low
Natural Gas Prices	Lower (-40%)
Coal Prices	Mid

- ATC footprint energy and peak demand grow at a slow rate (1.0% below the 5-year rate) because of a slow growing economy.
- Add UP Load Drivers
- Lower demand and the high (and potentially increasing) cost of retrofitting coal-fired plants to meet CAIR and CAMR regulations cause some smaller and aging coal-fired units within the ATC footprint to be retired for economic reasons (130 MW in 2013, 440 MW in 2018 and 2024). Nelson Dewey, a new 280 MW coal-fired generator under PSC review, helps to meet internal demand no longer met by retired units. The generation expansion plans both inside and outside of ATC come from MISO's Reference Future. However, plant capacities are scaled down on new units because of lower demand levels and reduced need for reserves.
- Add UP Generation Drivers
- The percent of energy in ATC from renewables meets the current Wisconsin RPS standards (10% by 2015). 8% of energy from renewables in 2013, 10% in 2018 and 2024.
- The combination of no CO2 tax and lower energy requirements results in lower demand and costs for natural gas. Without a CO2 tax, coal-fired plants serve proportionally more of the lower demand levels (than natural gas-fired generators), resulting in enough demand for coal to maintain "mid" level cost projections. Coal prices – MISO MAIN $2/MMBTU – delivered in 2010 and 2%/yr ($2.34 in 2018 and $2.59 in 2024)

ATC Futures (Text View)
DOE 20% Wind

Peak Growth Inside ATC	Mid-Upper - 2%
Energy Growth Inside ATC	Mid-Upper -2%
Peak Growth Outside ATC	Mid-Upper -2%
Energy Growth Outside ATC	Mid-Upper -2%
Generation Inside ATC	Lower
Generation Outside ATC	MISO's 20% Wind
RPS % Inside ATC	Upper
Renewable Source for ATC	Mid
General Environ Regs	Mid
Natural Gas Prices	Mid
Coal Prices	Lower (-10%)

- ATC footprint energy and peak demand grow at a somewhat faster rate (0.5% above the 5-year rate) because of a somewhat faster growing economy.
- Add UP Load Drivers
- The combination of a $25/ton CO2 tax, 25% higher mercury costs, substantial amounts of power from renewables and high (and potentially increasing) costs for retrofitting coal-fired plants to meet CAIR and CAMR regulations cause smaller, aging coal-fired units within the ATC footprint to be retired for economic reasons (270 MW in 2013, 880 MW in 2018 and 2024). Substantial wind power could help replace the retired smaller and aging coal-fired units. The generation expansion plans both inside and outside of ATC come from MISO's 20% Wind Future.
- Add UP Generation Drivers
- The percent of energy in ATC from renewables in 2013 is 20% and is 25% in 2018 and 2024, which is higher than required by current Wisconsin RPS standards (10% by 2015). The percent of energy outside ATC from renewables is 20%. A $25/ton CO2 tax is imposed and mercury costs are 25% higher.
- Additional wind power could result in more frequent dispatch of fast-start natural gas-fired combustion turbines because of the variability of wind. This could provide steady demand for natural gas and result in "mid" level costs. Because of the substantial amounts of energy coming from renewable resources, less low energy-cost generation, primarily coal-fired generation, would be needed, reducing the demand for and cost of coal.

ATC Futures (Text View)
Fuel & Regulatory Limitations

Peak Growth Inside ATC	Lower-Mid-1.3%
Energy Growth Inside ATC	Lower-Mid-1.3%
Peak Growth Outside ATC	Lower-Mid-1.3%
Energy Growth Outside ATC	Lower-Mid-1.3%
Generation Inside ATC	Mid
Generation Outside ATC	MISO's Reg. Limitation
RPS % Inside ATC	Mid (8% in 2013)
Renewable Source for ATC	Mid
General Environ Regs	Mid
Natural Gas Prices	Mid-Upper (+25%)
Coal Prices	Mid

- Lengthy regulatory proceedings for approval of new coal-fired generation and transmission delay some generation and transmission siting. There is a 5-year delay for new coal/IGCC permitting, These coal-fired generators are replaced by combustion turbine (CT) and combined cycle (CC) plants located near loads. Greater reliance on natural gas-fired units results in 20% higher costs. Furthermore, there is some disruption in fuel deliveries. Under these conditions, it would not be unusual to have somewhat more conservation with somewhat lower demand and energy growth rates.
- Add UP Load Drivers
- The combination of a $25/ton CO2 tax and 25% higher mercury costs plus the high (and potentially increasing) cost of retrofitting coal-fired plants to meet CAIR and CAMR regulations cause some smaller aging coal-fired units within the ATC footprint to be retired for economic reasons (130 MW in 2013, 440 MW in 2018 and 2024). Nelson Dewey, a new 280 MW coal-fired generator under PSC review, helps to meet internal demand no longer met by retired units. The generation expansion plans both inside and outside of ATC come from MISO's Regulatory Limitation Future.
- Add UP Generation Drivers
- The percent of energy in ATC from renewables in 2018 and 2024 is 15%, which is higher than required by current Wisconsin RPS standards (10% by 2015). A $25/ton CO2 tax is imposed and mercury costs are higher.
- Additional wind power and higher building standards (requiring better insulation, windows, furnaces, air conditioning, etc.) could also help temper demand for natural gas, somewhat reducing costs from historically high levels. Coal prices – MISO MAIN $2/MMBTU – delivered in 2010 and 2%/yr ($2.34 in 2018 and $2.59 in 2024)

Next Stakeholder Feedback Opportunity

- Review the ATC Preliminary Drivers Matrix
  - To request a call or meeting to discuss the Matrix
    - Brett French
      - Bfrench@atcllc.com
      - (906) 779 7902
- Provide feedback and comments to
  - Ken Copp
    - kcopp@atcllc.com
    - (262) 506 6890
- ATC requests feedback and comments by November 26, 2008

Overall Timeline

- May/October 08 (Complete)
  - Initial meetings plus follow-up data gathering/ verification meetings
- June/October 08
  - Develop U.P. area futures based on customer and ATC executive feedback
- August/October 08
  - Develop Planning study models for each of these futures for 2009, 2013, 2018, 2023
- October/December 08
  - Complete load flow studies on all the planning models, summarize findings/needs
  - Update executives on needs
- November 08/January 09
  - Brainstorm project alternatives to meet needs with stakeholders
  - Determine sets of project alternatives for each of the futures
  - Update/receive feedback from executives on possible alternatives

Overall Timeline (cont.)

- December 08/ January 09
  - Analyze, select primary and secondary alternatives for each future
  - Determine if economic analysis of alternatives is needed
  - Review findings of need and proposed alternatives with stakeholders and executives
- February 09
  - Get cost estimates, constructability/ environmental/ other issues
  - Make final recommendations for strategy to ATC executives
  - Share results with stakeholders/customers
- February-April 09
  - Develop PRFs/Scope documents needed for projects

Next Steps

- Continuing feedback from stakeholders, including MPSC staff
- Post results of meetings, allowing for final input from all stakeholders
- Make final decision on futures
- Work with stakeholders to define alternatives
- More fully develop analysis methodology
- We will continue to meet with stakeholders and MPSC staff throughout the analysis process