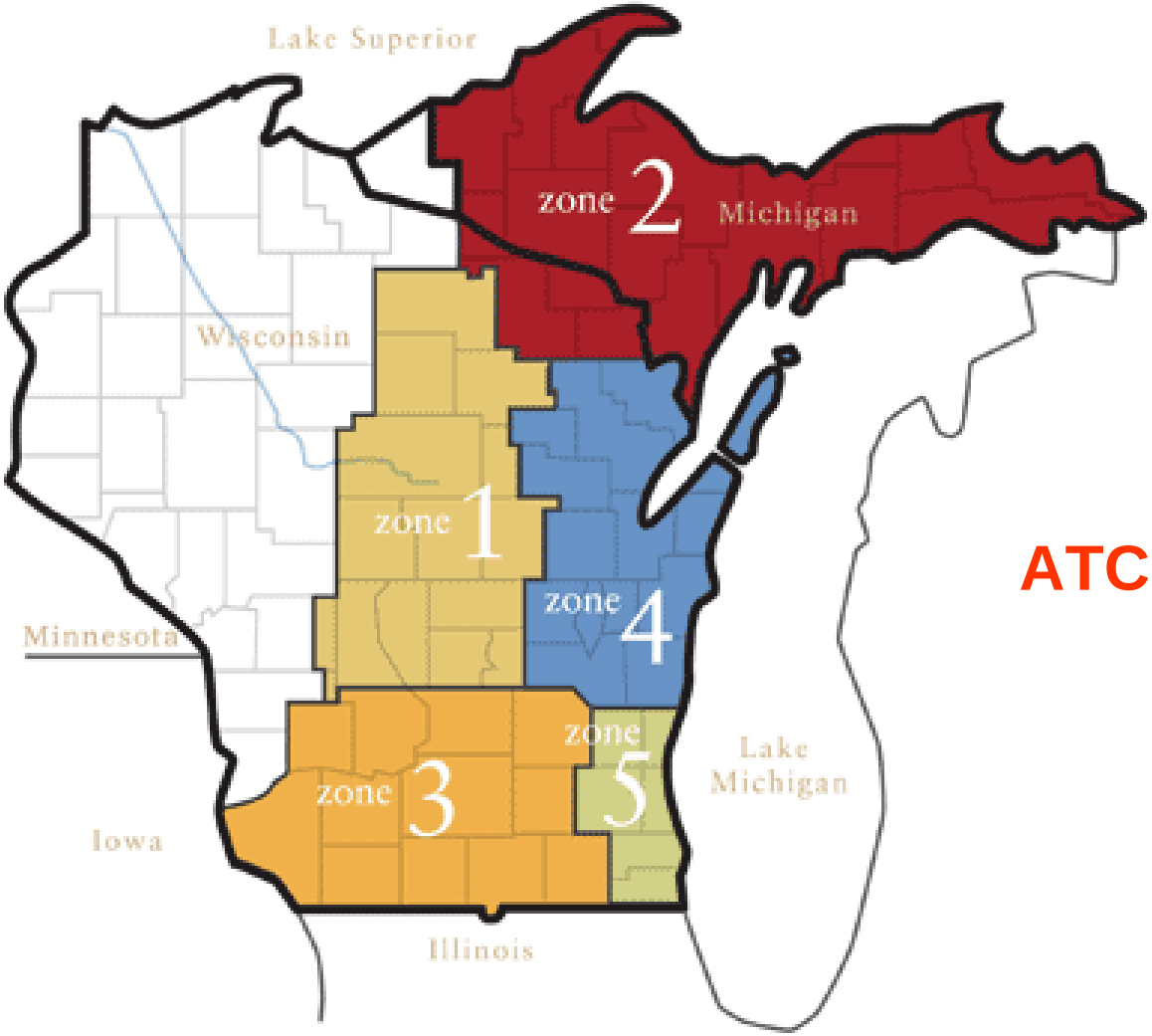
AMERICAN TRANSMISSION COMPANY LLC
THE ENERGY ACCESS COMPANY

Transmission Business Briefing



ATC's service area

Our progress in five years

A more reliable transmission system

- Invested $481 million to:
  - Upgrade more than 565 miles of power lines
  - Improve 79 substations
  - Build 75 miles new power lines
  - Connect 1,767 megawatts new generation

What this work means

- ATC now can:
  - Deliver up to 12,765 megawatts to customers in Wisconsin, Michigan and Illinois
  - Maintain 99.96% availability rating
  - Support 828 MW new peak usage
  - Increase import power by 1,000 MW

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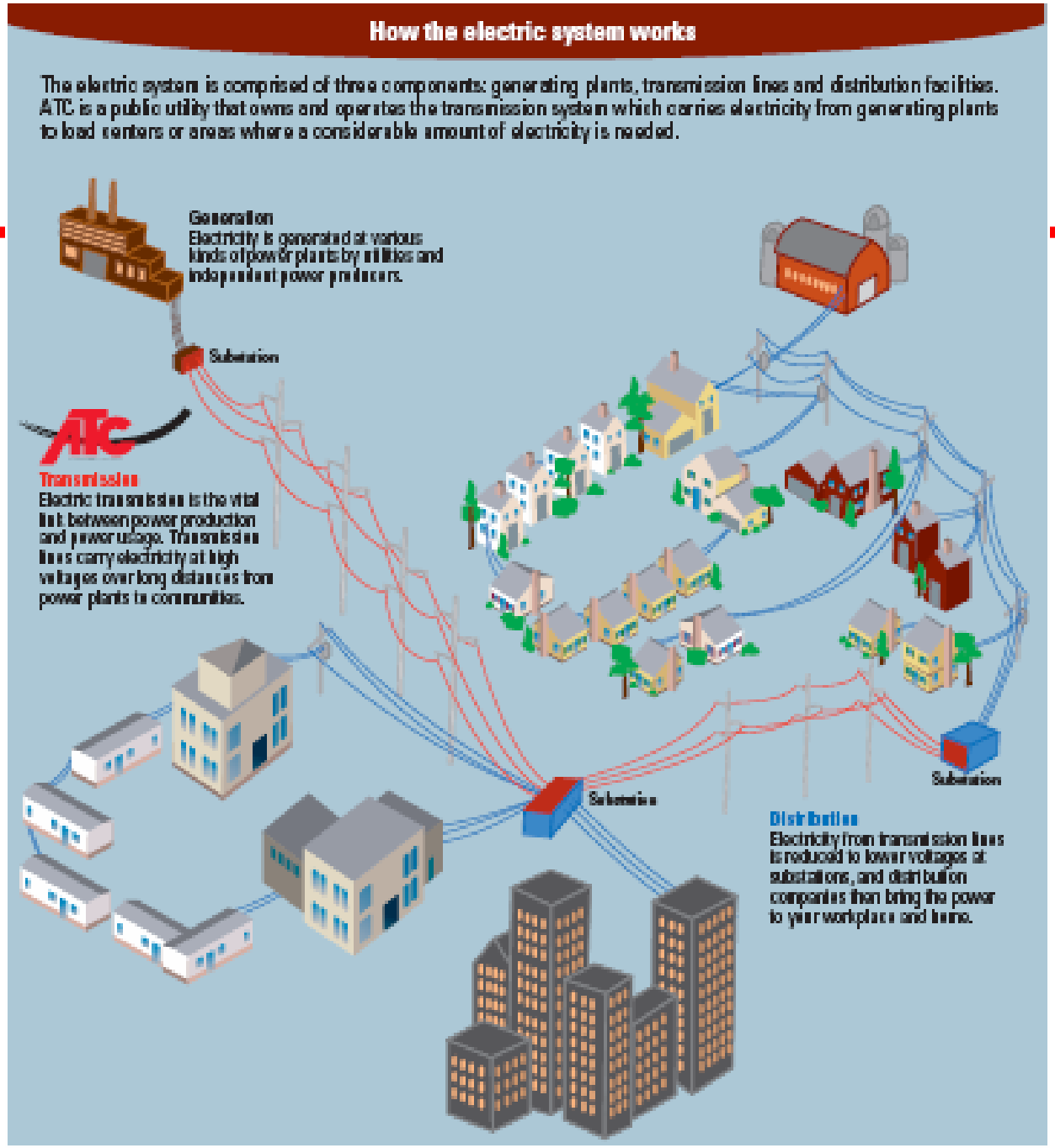

The vital link

Moving power into or through our system

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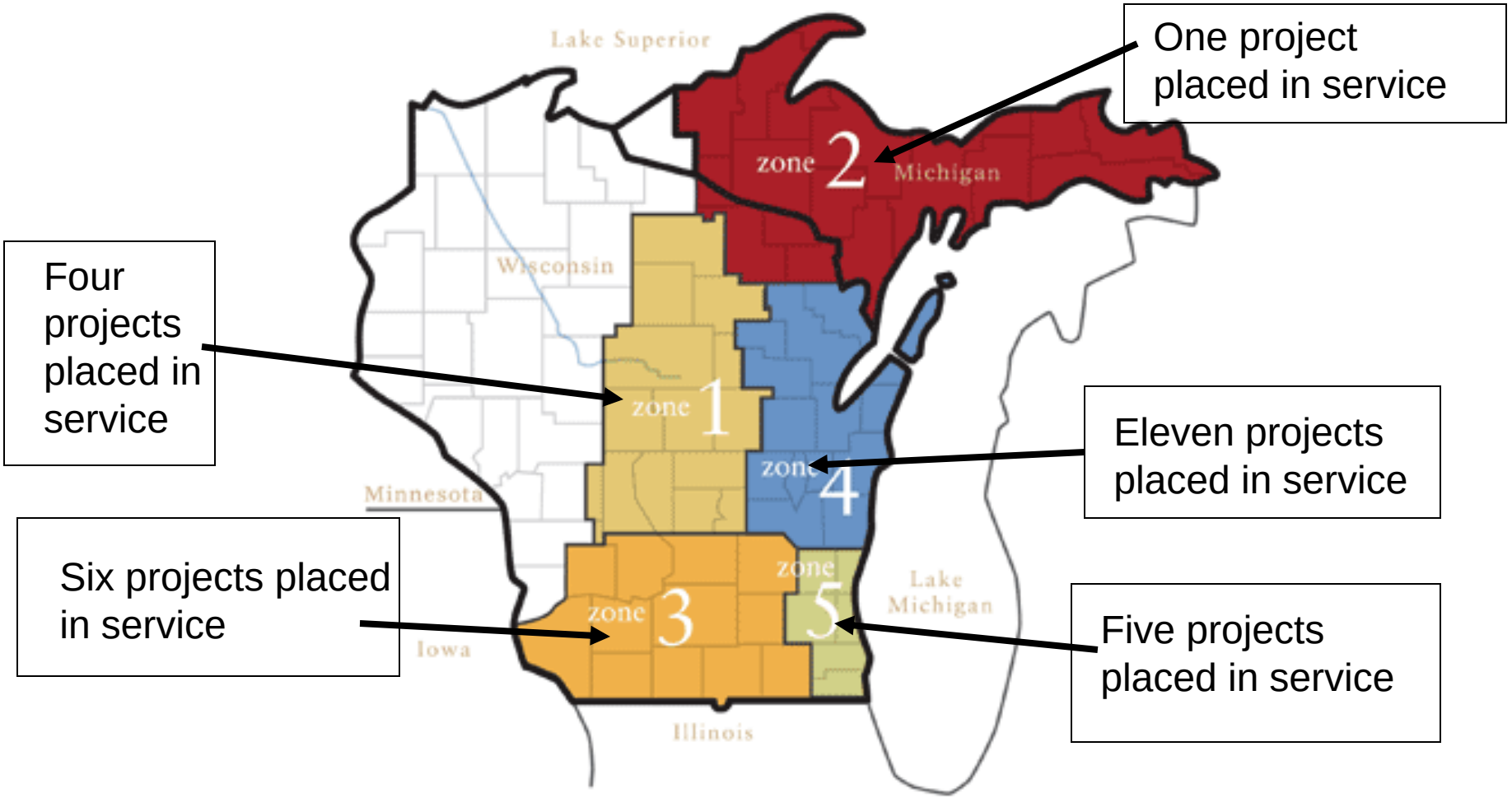
Specific projects (completed):

- Blackhawk-Colley Road (Rock County)
- Christiana-Kegonsa (Dane County)
- Eau Claire-Arpin (Wood County)
- Kewaunee Area Projects (Kewaunee County)
- Manistique-Hiawatha (Schoolcraft and Mackinac counties)
- North Appleton-Lost Dauphin (Outagamie and Brown counties)
- North Appleton-White Clay (Outagamie and Shawano counties)
- Paris-St. Martins (Kenosha, Racine, and Milwaukee counties)
- Rhinelander Area Projects (Lincoln, Oneida and Langlade counties)
- Wempletown-Paddock (Rock County and northern Illinois)
- Whitewater-Mukwonago (Walworth and Waukesha counties)

27 projects completed since 2004



One project placed in service

Four projects placed in service

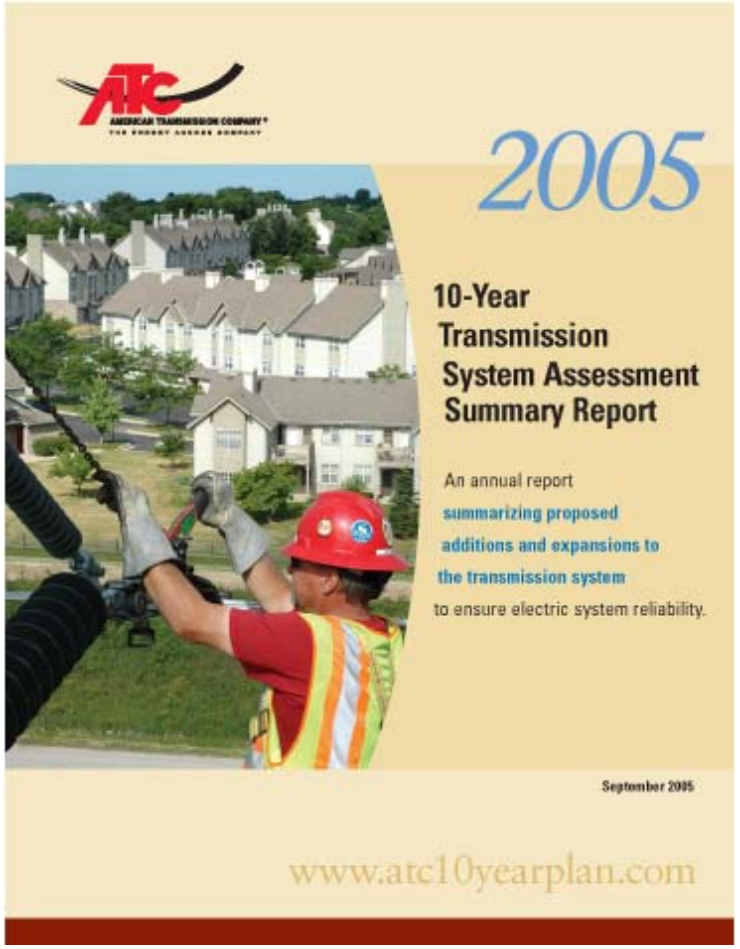
Eleven projects placed in service

Six projects placed in service

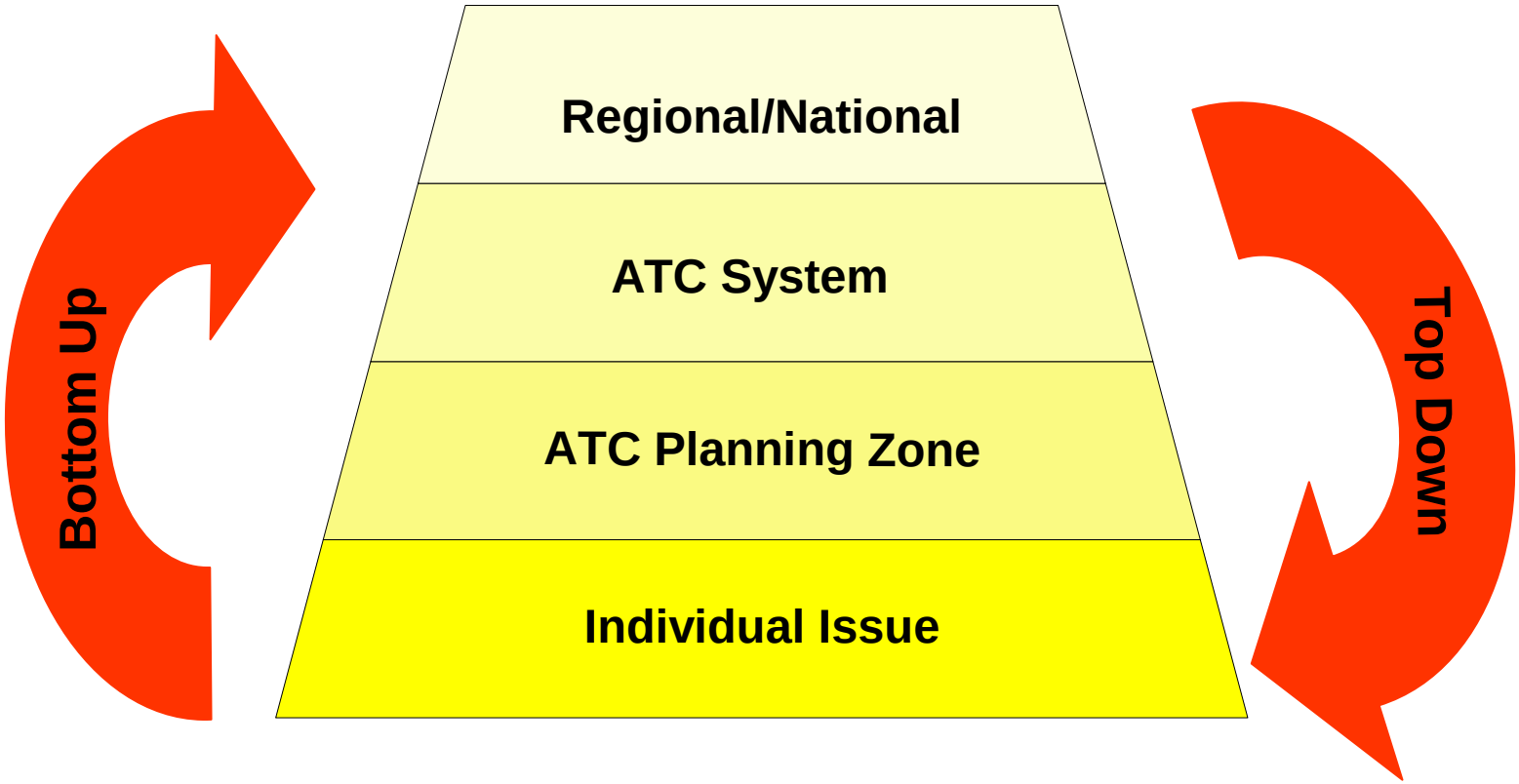
Five projects placed in service

10-Year system assessment

- Fifth year of assessment and report
- Covers years 2005 through 2015
- Identifies conditions that drive plans for upgrades and expansion
- Identifies projects needed to improve system adequacy and reliability



Multi-level planning process



Changes since 2004

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Table ES-1
Summary of American Transmission Co.'s
2005 Transmission System Assessment

	2004 Update	2005 Assessment
	(March 2005)	(September 2005)
New Transmission Lines Requiring New Right-of-Way		
345 kV	8 lines / 340 miles	8 lines / 340 miles
138 kV	17 lines / 95 miles	14 lines / 77 miles
115 kV	3 lines / 32 miles	2 lines / 26 miles
69 kV	7 lines / 53 miles	12 lines / 82 miles
Transmission Lines to be Constructed, Rebuilt, Reconductored or Uprated on Existing Right-of-Way		
345 kV	8 lines / 140 miles	5 lines / 114 miles
161 kV	1 / 20 miles	1 / 20 miles
138 kV	49 lines / 889 miles	42 lines / 706 miles
115 kV	4 lines / 78 miles	4 lines / 78 miles
69 kV	11 lines / 80 miles	11 lines / 66 miles
New Transformers to be Installed		
(# of transformers / total increase in capacity)	44 transformers / 8,467 MVA	41 transformers / 8,457 MVA
New Capacitor Banks to be Installed		
(# of installations / capacity)	24 installations / 1,047 MVAR	35 installations / 1,255 MVAR

Assessment enhancements and additions

- Interactive Web site with links
  - www.atc10yearplan.com
- Transmission Access Initiative
- 20-year analysis goals
  - Started in 2005 TYA, finish for 2006 TYA
  - System consistency
  - Identify generation sites
- ATC regional studies involvement
- Maintenance projects greater than $500,000
- Prioritization methodology tool

Assessment enhancements and additions

- Reactive power analysis
  - Reduce generation MVAr capability by 10%
  - First contingencies
  - No significant impact
- Multiple outage analysis
  - Additional steady state and dynamics studies
  - Rechecked critical contingencies
  - Meet national reliability standards with load shedding/operating procedures
- All projects assessment
  - 2010 and 2014 studies
  - Project synergy (don't create new problems)

System expansion drivers

- Electric load growth
- Transmission-distribution interconnections
- Transmission service limitations
- New generation
- Transmission service requests
- System repair or replacement
- Economic strategic expansion

Types of Projects

Line projects

- New line
- Rebuilt line
- Reconductor line
- Uprate line
- Convert voltage

Substation Projects

- New Substation
- Existing substation expansion
- Equipment additions and replacements

Project classifications

Project Activity	Planned	Proposed	Provisional
ATC planning work and analysis	**Studies completed**	**Studies are not complete**	**Studies are not complete**
Construction application For regulatory review	**Application under review or approved**	**Application has not been submitted**	**No action on preparing or submitting an application**
Project implementation phase	**Project approved and under construction or being engineered for construction**	**Project identified as preferred solution to transmission issue**	**Project is placeholder and among several solutions being evaluated and studied**
System solution included in power flow models	**Project included to show impact on system**	**Project not included**	**Project not included**

Load interconnection requests

New transmission to distribution substations

Add transmission to distribution transformers at existing substations

Replace transmission to distribution transformers at existing substations

Zone	New	Add	Replace	Total
1	15	13	1	29
2	6	11	2	19
3	49	21	10	80
4	23	34	12	69
5	13	16	2	31
Totals	106	95	27	228

Generator requests placed in service

Date	Requests On-Line	Megawatts
2000	Eden/Little Badger	31
2001	Combined Locks	53
6/1/2003	Pulliam CT, Petenwell/Big Pond	105
3/19/2004	Kewaunee uprate	43
6/1/2004	Kaukauna CT	60
6/15/2004	Riverside	655
5/1/2005	West Campus	150
6/1/2005	Fox Energy	300
6/2/2005	Sheboygan	370
	Total	**1,767**

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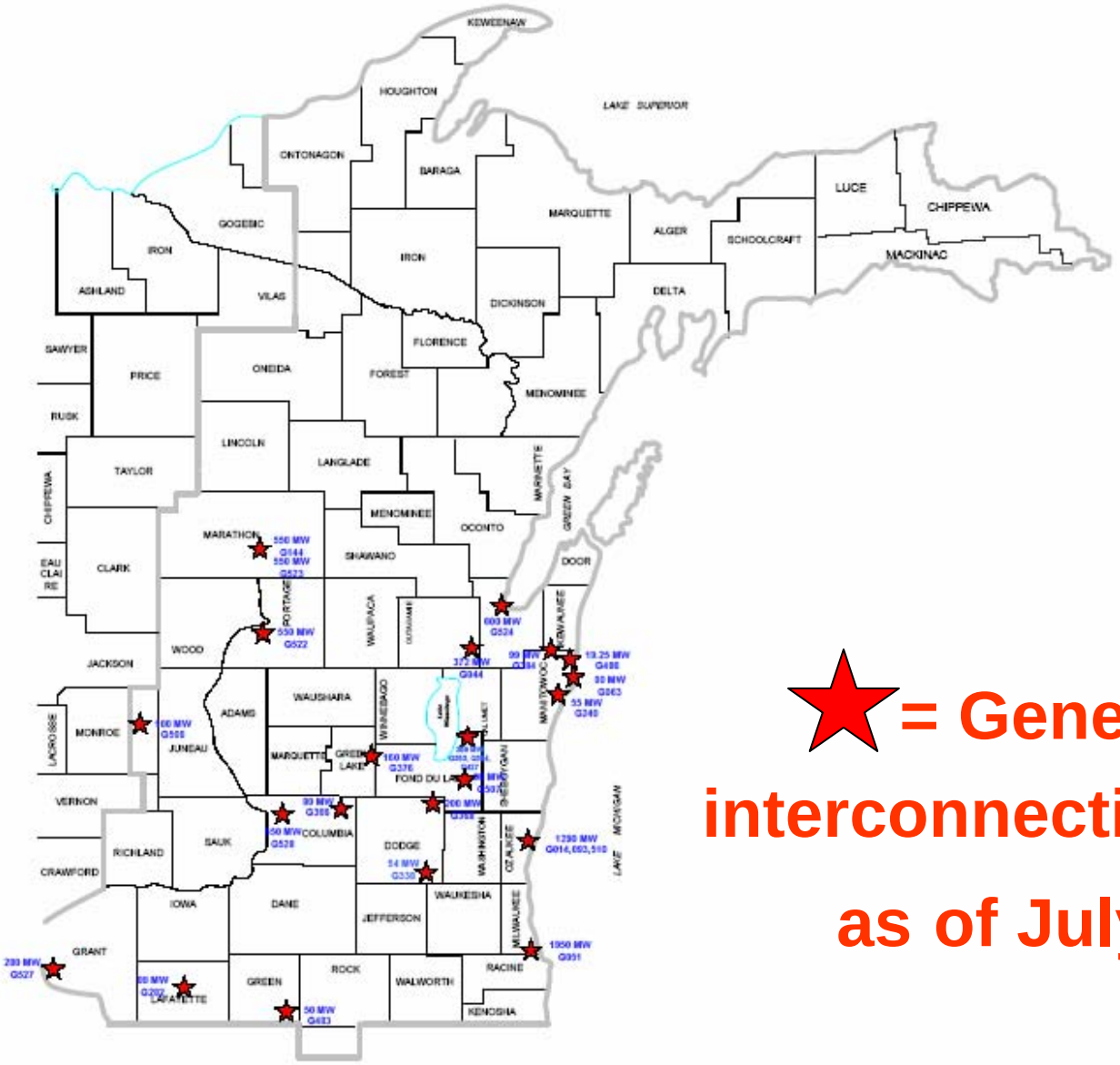

★ = Generation interconnection requests as of July 1, 2005

Chronic transmission loading relief incidents - 2004

Limiting Element	Anticipated Element Outage	Total Declarations
Albers-Paris 138 kV	Wempletown-Paddock 345 kV	29
Eau Claire-Arpin 345 kV		10
Highway V-Preble 138 kV	Lost Dauphin-Red Maple 138 kV	29
Oak Creek 345/230 kV transformer	Oak Creek banks T851/T895	24
Stiles-Amberg/Stiles-Crivitz 138 kV	Morgan-Plains 345 kV	154
Stiles-Pioneer 138 kV	White Clay-Morgan 138 kV	19
White Clay-Morgan 138 kV	Pulliam-Stiles 138 kV	22

Zone 1 – North Central Wisconsin

- Growth projections
  - Population: 0.6% from 2005-2010
  - Employment: 1.2% from 2005-2010
- Environmental considerations
  - North: woodlands and lakes
  - South: agricultural
  - National forests and wildlife refuges
- Electricity demand and generation
  - Expected load growth: 2% from 2006-2014
    (2006 peak load is 1,789 MW)
  - Net importer of power during peak demand periods
  - New generation: Weston 4 (550 MW)

Zone 1 system conditions

- **2006**
  - Low voltages in Rhinelander loop
  - Low voltages in Tomah area
  - Overloaded facilities for Weston-Sherman St. outage
- **2010**
  - Same problems as in 2006, but worse if planned and proposed projects are not completed
  - Widespread overloaded facilities in Wausau area with addition of Weston G4 without Gardner Park-Central Wisconsin 345 kV line and 115 kV reinforcements

Zone 1 system conditions

- **2014**
  - Emerging overloads to system feeding the Rhinelander loop
  - Emerging overloads and low voltages in the Wautoma, Berlin and Ripon areas
  - Additional generation requests in the Wausau or Plover areas may impact transmission system plans

Zone 1
45+ projects 2005-2015

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Most notable projects include:

Planned

- 2 Arrowhead-Weston 345 kV line (2006/2008)
- 5 Gardner Park-Central Wisconsin 345 kV line (2009)

Proposed

- 7 Weston-Sherman St.-Hilltop rebuild (2007)
- 8 Cranberry-Conover 115 kV line (2008)

Provisional

- 9 Monroe County-Council Creek 161 kV line (2010)

Zone 2 – Northern Wis./Mich. UP

- Growth projections
  - Population: 0.2% from 2005-2010
  - Employment: 1.3% from 2005-2010
- Environmental considerations
  - Heavily forested areas
  - Many lakes, rivers and streams
- Electricity demand and generation
  - Expected load growth: 0.8% from 2006-2014
    - 2006 peak load is 906 MW
  - More generation (at maximum output) than peak load
  - Normal operating condition: net importer of power

Zone 2 system conditions

- **2006**
  - Low voltages in west side from Conover to Ontonagon
  - Low voltages in far eastern area
  - Severely limited import capability from Wisconsin
- **2010**
  - Same problems as in 2006, but worse if planned and proposed projects are not completed
  - Cranberry-Conover-Plains improves voltages and reliability
  - Hiawatha-Pine River-Mackinac (Straits) and Hiawatha-Indian Lake improves area voltages
  - Various Zone 4 projects significantly improve import capability

Zone 2 system conditions

- **2014**
  - Poor condition and system reliability issues requires rebuild of two 69 kV lines to 138 kV operation
  - Higher than expected load growth could require additional capacitor projects at Hiawatha, M38 and Empire Substations
  - Blaney Park-Munising rebuild/conversion addresses overloads and voltages in Central UP
  - Chalk Hills-Chandler rebuild/conversion improves reliability and diversifies ties between Zone 2 and Zone 4

Zone 2
35+ projects 2005-2015

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Most notable projects include:

Planned

1. Stiles-Amberg 138 kV line rebuild (2006)
2. String second Hiawatha-Indian Lake circuit and convert both to 138 kV (2006/2009)

Proposed

5. Cranberry-Conover 115 kV line and Conover-Iron River-Plains rebuild and conversion to 138 kV (2008)

Provisional

6. Hiawatha-Pine River-Mackinac (Straits) 69 kV line rebuild and conversion to 138 kV (2009)
7. Blaney Park-Munising 69 kV line rebuild and conversion to 138 kV (2012)

Zone 3 – Southern Wis./Northern Ill.

- Growth projections
  - Population: 0.8% from 2005-2010
  - Employment: 1.5% from 2005-2010
- Environmental considerations
  - Wetlands, major rivers, numerous lakes
- Electricity demand and generation
  - Expected load growth: 3.3% from 2006-2014; higher in Madison area
    - 2006 peak load is 3,290 MW
  - More generation (at maximum output) than peak load
  - Normal operating condition: net importer of power

Zone 3 system conditions

- **2006**
  - Low voltages, especially in Madison area, and transmission facility overloads identified through out area are current and emerging concerns
  - Higher than average load growth in Rock and Walworth counties
  - Intact system is supported by new generation on the UW Campus
  - A substantial amount of power is imported into Dane County
- **2010**
  - Same problems as in 2006, but worse if planned and proposed projects are not completed
  - North Madison-Waunakee 138 kV line addresses cascading overloads in the Madison Area
  - Stony Brook-Jefferson line along with the Rockdale-Mill Road 345 kV line addresses voltage problems and line overloads in Jefferson County
  - N. Lake Geneva-White River-S. Lake Geneva 138 kV project will temporarily improve voltages in southwest Zone 3

Zone 3 system conditions

- **2014**
  - Widespread voltage collapse in Madison area a concern
  - Low voltages on 69 kV and 138 kV in Wisconsin Dells area
  - Low voltages at/near Richland Center and along 69 kV line from Gran Grae to Lone Rock requires reinforcement
  - West Middleton-Rockdale 345 line along with additional 138 kV lines addresses serious voltage problems in Dane County
  - Lake Delton-Birchwood 138 kV line addresses voltages and reliability for Wisconsin Dells area load
  - Eden-Muscoda-Richland Center 69 kV line and Eden-Hillman voltage conversion addresses widespread voltage problems in southwest Wisconsin

Zone 3
90+ projects 2005-2015

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Most notable projects include:

Planned

- 3 Convert Columbia-North Madison 138 kV line to 345 kV (2006)
- 4 Femrite-Sprecher 138 kV line 138 kV (2007)

Proposed

- 5 Jefferson-Lake Mills-Stony Brook 138 kV line (2007)
- 6 Rubicon-Hustisford-Horicon 138 kV line (2008)
- 7 North Madison-Waunakee 138 kV line (2008)
- 10 Rockdale West Middleton 345 kV line (2011)

Provisional

- 12 N. Lake Geneva-White River-S. Lake Geneva 138 kV line (2009)
- 13 Lake Delton-Birchwood 138 kV line (2011)
- 15 Eden-Muscoda-Richland Center 69 kV line (2012)
- 17 Twin Lakes-Spring Valley 138 kV line (2013)

Zone 4 – Northeast Wisconsin

- Growth projections
  - Population: 0.8% from 2005-2010
  - Employment: 1.2% from 2005-2010
- Environmental considerations
  - Major lakes: Michigan and Winnebago
  - State forests and Horicon National Wildlife Refuge
- Electricity demand and generation
  - Expected load growth: 2.5% from 2006-2014
    - 2006 peak load is 3,251 MW
  - More generation than peak load
  - Net exporter during lighter load periods

Zone 4 system conditions

- **2006**
  - Green Bay area is severely congested
  - Voltage problems in Door County
  - Severely limited import capability between Wisconsin and Upper Peninsula
- **2010**
  - Low import capability into Manitowoc area
  - Morgan-Werner West provides an “electrical bypass” of Green Bay relieving the overloaded facilities (2009)
  - Canal-Dunn Road 138 kV improves Door County voltages, but not completely (2008)
  - Stiles-Amberg double circuit 138 kV line rebuild addresses facilities in poor condition and transfer capability between Wisconsin and Upper Peninsula (2006)

Zone 4 system conditions

- **2014**
  - Continuing voltage problems in Door County
  - Dunn Road-Egg Harbor 69 kV line further improves Door County voltage problems (2010)
  - Pulliam-Suamico-Sobieski-Pioneer 69 kV rebuild and 138 kV conversion projects address facility overloads, load serving issues and facilities in poor condition (2008/2015)

Zone 4
40+ projects 2005-2015

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- Most notable projects include:

Planned

- 3 Werner West 345/138 kV Substation (2006)
- 4 Stiles-Amberg double circuit 138 kV line rebuild (2006)
- 5 Morgan-Werner West 345 kV line & Clintonville-Werner West 138 kV line (2009)

Proposed

- 6 Canal-Dunn Road 138 kV line (2008)
- 7 Dunn Road-Egg Harbor 69 kV line (2010)

Provisional

- 8 Pulliam-New Suamico 69 kV line rebuild & conversion to 138 kV
- 13 New Suamico-Pioneer 69 kV line rebuild & conversion to 138 kV (2015)

Zone 5 – Southeast Wisconsin

- Growth projections
  - Population: 0.5% from 2005-2010
  - Employment: 1.0% from 2005-2010
- Environmental considerations
  - Most densely populated zone
  - Agricultural land use is common
  - Lake Michigan, major rivers and Kettle Moraine State Forest
- Electricity demand and generation
  - Expected load growth: 1.6% from 2006-2014
    - 2006 peak load is 4,728 MW
  - More generation than peak load
  - Net exporter during lighter load periods

Zone 5 system conditions

- **2006**
  - Continued load growth in Waukesha, Washington and Jefferson counties driving need for voltage support
  - New generation in greater Milwaukee area will drive many system improvements within next decade
  - Waukesha-Duplainville-Sussex 138 kV line constructed in 2005 addresses load serving and voltage support issues in Sussex area
- **2010**
  - Weak 138 kV network in Waukesha, Washington, and Jefferson needs support
  - Cornell-Range Line and St. Lawrence-Pleasant Valley-Saukville 138 kV line rebuild addresses facility condition and overloads related to new generation at Port Washington (2008)
  - Looping Ramsey-Harbor 138 kV line into Kansas and Norwich substations creating Kansas-Harbor and Ramsey-Norwich lines relieves overloads related to new generation at Oak Creek (2009)

Zone 5 system conditions

- **2014**
  - Transmission additions and modifications required by new Port Washington and Oak Creek generation projects removed most overloads and low voltages seen in 2006 and 2010
  - Twin Lakes-Spring Valley line will improve the Lake Geneva area and provide support to the far southwest part of Zone 5 (2013)
  - Rockdale-Concord-Bark River-Mill Road 345 kV line along with Bark River and Concord substation expansions for 345 kV facilities and 345/138 kV transformation addresses (2011)
    - Voltage profiles in Jefferson, Waukesha and Washington counties
    - Reduces loading on weak parallel 138 kV network
    - Reduces system losses and
    - Increases east-west transfer capability

Zone 5 projects
30+ projects 2005-2015

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- Most notable projects include:

<u>Planned</u>

1. Cornell-Range Line and St. Lawrence-Pleasant Valley-
2. Saukville 138 kV line reconductor (2008)
3. Expand 345/230/138 kV Substations at Oak Creek (2009)
4. Convert Bark River-Mill Road 138 kV line to 345 kV (2011)

<u>Proposed</u>

5. Expand Hale (Brookdale) Substation (2013)
6. Loop Zion-Arcadian 345 kV line into Pleasant Prairie Substation (2013)
7. Oak Creek-Hale-Granville 345 kV line (2013)

Major projects in design or under construction

Project	Area
Arrowhead-Gardner Park (Weston) 345 kV line	Zone 1
Gardner Park (Weston) 345/115 kV Substation	Zone 1
Rebuild and convert one Hiawatha-Indian Lake 69 kV line to double circuit 69 kV	Zone 2
Convert Columbia-N. Madison 138-kV to 345 kV operation	Zone 3
Uprate North Appleton-Rocky Run 345 kV line	Zone 4

Major projects fully approved by PSC

Project *	***Area***
N. Beaver Dam-E. Beaver Dam 138 kV line	Zone 3
Sprecher-Femrite 138 kV line	Zone 3
Turtle-Bristol 69 kV line rebuild to 138 kV and operated at 69 kV	Zone 3
Werner West 345/138 kV substation	Zone 4
* *Approved but not yet under construction*	

Major projects awaiting regulatory approval

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Project	Area
Gardner Park-Central Wisconsin 345 line	Zone 1
West-Serman St.-Hilltop 115 kV line to double-circuit 115 KV	Zone 1
Cranberry-Conover 115 kV line and rebuild/convert Conover-Plains to 138 kV operation	Zone 1&2
Jefferson-Lake Mills-Stony Brook 138 kV line	Zone 3
Morgan-Werner West 345 kV line and Werner West-Clintonville 138 kV line	Zone 4

Major projects eliminated

Projects Cancelled	Former In-service date	Planning Zone	Reason for Removal
Reconfigure 345 kV bus at Pleasant Prairie	2006	5	Another alternative selected (Bain)
Install two 345 kV series breakers at Pleasant Prairie on lines to Racine and Zion	2009	5	Oak Creek Study Results
Replace 138 kV over-dutied breakers at Bluemound SS	2009	5	Oak Creek Study Results
Expand 345 kV switchyard at Bain Substation and string Bain-Racine 345 kV circuit	2012	5	Oak Creek Study Results
Replace 22 138 kV over-dutied breakers at Harbor, Everett and Haymarket substations	2014	5	Oak Creek Study Results

Cost estimates
Estimated capital costs

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	2004* TYA	2005 TYA	
▪ Asset renewal	$163	$238	Million
▪ Generation interconnections	$167	$339	Million
▪ Distribution interconnections	$242	$234	Million
▪ Infrastructure relocation	$3	$4	Million
▪ Network	$2143	$2411	Million
▪ Protection and control	$87	$83	Million
▪ **Total**	**$2.8**	**3.4**	**Billion**
▪ **Total for projects in TYA**	**$2.1**	**2.4**	**Billion**

* Values same in 2004 TYA Update

Reasons for cost increases

- Increases in the cost of steel and construction labor
- Revisions to planned, proposed and provisional projects based on current analyses
- Start-up of new, large projects

Project prioritization index: factors considered

- Safety/service restoration
- System reliability/security
- Regulatory mandates
- Load serving/interconnection
- Transaction limit alleviation
- Strategic expansion
- Infrastructure update
- In-service date
- Cascading outage
- Equipment damage/loss of load
- Reduced redispatch/transmission load relief mitigation

Transmission Business Briefing

Questions?

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