# 2009 10-Year Assessment
# Two Futures

## Customer and Stakeholder Update Meeting

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Pewaukee CR160

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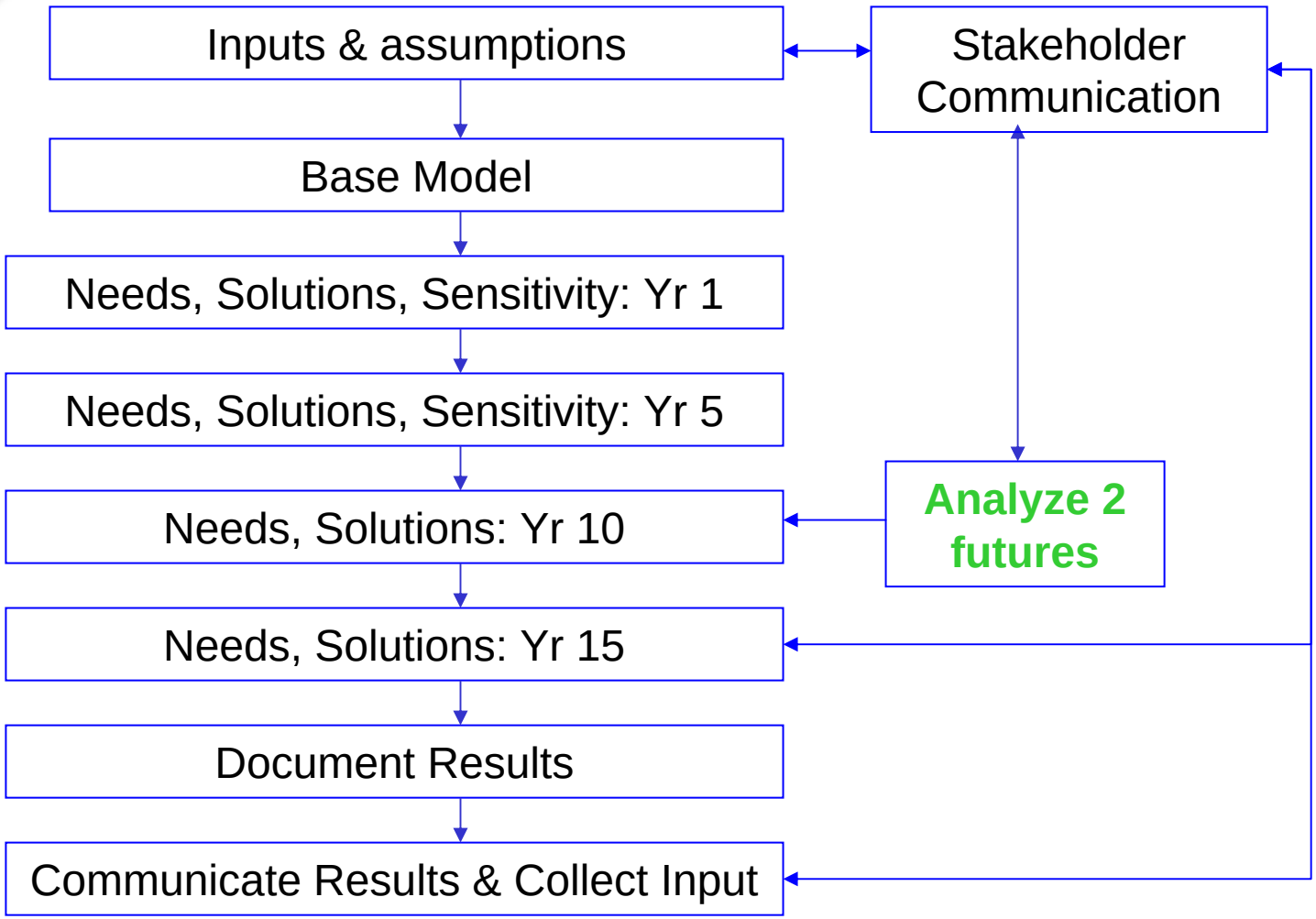
# Purpose

- Review Futures Process
- Review Assumptions
- Summarize Results

# Process



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# Process

- Selected 2 of 6 Futures
  - Slow growth
  - DOE 20% Wind
- PROMOD to Load Flow Data
- Develop Load Flow Models
- Compare Needs to Expected
- Project Development Input

# Assumptions

- Expected Future
  - 2019 summer peak hour
  - ATC Peak load: 16,332 MW
  - ATC generation: 15440 MW
  - ATC imports: ~900 MW
  - 0 generators forced out
  - No speculative wind added in ATC footprint
  - ATC Control Area Merit Order dispatch
  - External Topology: 2008 MMWG Series
  - ATC Topology: Project Deficient

# Assumptions

- Slow Growth
  - 2019 summer peak hour
  - ATC Peak load: 13,593 MW
  - ATC generation: 12,879 MW
  - ATC imports: ~700 MW
  - 5 generators forced out
  - No Speculative wind added in ATC footprint
  - Constrained dispatch
  - External Topology: JCSP
  - ATC Topology: Project Deficient

# Assumptions

- 20% Wind
  - 2019 summer peak hour
  - ATC Peak load: 15,999 MW
  - ATC generation: 14,602 MW
  - ATC imports: ~1,400 MW
  - 5 generators forced out
  - Total ATC Dispatched Wind: 441 MW
  - Added ATC Dispatched CT generation: 525 MW
  - Constrained dispatch
  - External Topology: JCSP
  - ATC Topology: Project Deficient

# Assumptions

- Assumptions Summary
  - Analysis experiment, limited time
  - Difficult PROMOD to load flow translation
  - Suspect limited bias flows
    - Very Limited Transmission additions
    - Limited wind output (PROMOD peak)
    - Wind not explicitly modeled outside ATC
  - Project deficient load flow models (TYA standard)
  - Therefore, wind impact unreasonably limited

# Results Summary

- Relative to Expected Future
- Generally Slow growth improved
- Generation redispatch aggravates some conditions for both futures, especially Wind
- Wind impact may be unreasonably limited by assumptions

# Slow Results

**Zone 1:** Voltages improved
Transformer overloads generally improved
Line overloads generally improved

**Zone 2:** Line overloads generally improve
Some worsened – generation mitigates
Removes Pine River-Straits overload

**Zone 3:** Line overloads generally improve
Line overloads/bus voltages sometimes worsen significantly
- area projects/control adjustments mitigate
Lake Geneva area Voltages improve

**Zone 4:** In general, no constraints

**Zone 5:** Loading improves
In general, no constraints found

# Wind Results

**Zone 1:** Voltages generally improved 2-3%
Transformer overloads generally worsened
Line overloads generally improved

**Zone 2:** Escanaba area voltages worsen - generation mitigates
Line overloads generally worsen - generation mitigates
Removes Pine River-Straits overload
Plains transformer overloads

**Zone 3:** Line overloads generally improve
Line overloads/bus voltages sometimes worsen significantly
- area projects/control adjustments mitigate
Lake Geneva area Voltages
Lamar/Fulton/Harmony Voltages worsen - area project proposed mitigates

**Zone 4:** Line and transformer overloads worsen in Door County Peninsula
Bus voltages worsen in Door County Peninsula
Line overloads worsen in Manitowoc area

**Zone 5:** Line and transformer overloads improve
Arcadian transformer overload worsens
Germantown, Bark River, Maple voltages worsen

# For more information

Contact David Smith at dsmith@atcllc.com
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# Thanks for Participating!



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