



Grid of Tomorrow

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National Academy of Sciences

TVA's Mission

Energy



Provide affordable electric power throughout the Tennessee Valley

Environment



Act as a steward of the Valley's natural resources

Economic Development



Serve as a catalyst for sustainable economic development

Who We Serve

PARTNERING

with **154**

Local Power
COMPANIES

TO SERVE

10 MILLION
PEOPLE

700,000
Businesses

IN
PARTS
OF

7 STATES



Directly Serve

58

LARGE industries &
federal installations

The TVA Power System

The map illustrates the extensive TVA power system, centered on the Tennessee River. Key features include:

- States:** Kentucky, Tennessee, Virginia, North Carolina, Georgia, Alabama, and Mississippi.
- Dams and Locks:** Numerous dams are marked along the river, including the Kentucky Dam & Lock, Cumberland Fossil Plant, Johnsonville Combustion Turbine Plant, Cedar Dam, Pin Oak Dam, Beech Dam, Pine Dam, Lost Creek Dam, Sycamore Dam, Brownsville Combustion Turbine, BRIDGES Center, Allen Fossil Plant, Southaven Combined Cycle Plant, Magnolia Combined Cycle Plant, University of Mississippi Intramural Sports Complex, Caledonia Combined Cycle Plant, Ackerman Combined Cycle Plant, Kemper Combustion Turbine, Pickwick Landing Dam & Lock, Florence Water Treatment Facility, Colbert Combustion Turbine, Wilson Dam & Lock, Cedar Creek Dam, Little Bear Creek Dam, Bear Creek Dam, Upper Bear Creek Dam, Tims Ford Dam, Normandy Dam, Sequoyah Nuclear Plant, Chickamauga Dam & Lock, Nickajack Dam & Lock, Watts Bar Nuclear Plant, Watts Bar Dam & Lock, Great Falls Dam, Kingston Fossil Plant, American Museum of Science and Energy, Morgan County Vocational Technical School, Buffalo Mountain, Norris Dam, Cherokee Dam, John Sevier Dam, John Sevier Combined Cycle, Nolichucky Dam, Cocke County High School, Melton Hill Dam & Lock, Ft. Loudoun Dam & Lock, Tellico Dam, Fontana Dam, Apalachia Dam, Hiwassee Dam, Chatuge Dam, Nottely Dam, Blue Ridge Dam, Ocoee #1 Dam, Ocoee #2 Dam, Ocoee #3 Dam, Raccoon Mountain Pumped Storage Plant, Finley Stadium, Huntsville Botanical Garden, Browns Ferry Nuclear Plant, Guntersville Dam & Lock, and Clear Creek Dam.
- Power Plants:** Various power plants are indicated, including the Shawnee Fossil Plant, Marshall Combustion Turbine, Gibson County High School, Lagoon Creek Combustion Turbine & Combined Cycle Plant, Cedar Creek Dam, Little Bear Creek Dam, Bear Creek Dam, Upper Bear Creek Dam, Caledonia Combined Cycle Plant, Ackerman Combined Cycle Plant, Kemper Combustion Turbine, and several other fossil and nuclear plants.
- Other Landmarks:** The map also shows the Lovers Lane Soccer Complex, Adventure Science Center, Gallatin Fossil Plant & Combustion Turbine, Morgan County Vocational Technical School, American Museum of Science and Energy, Morgan County Vocational Technical School, Buffalo Mountain, Norris Dam, Cherokee Dam, John Sevier Dam, John Sevier Combined Cycle, Nolichucky Dam, Cocke County High School, Melton Hill Dam & Lock, Ft. Loudoun Dam & Lock, Tellico Dam, Fontana Dam, Apalachia Dam, Hiwassee Dam, Chatuge Dam, Nottely Dam, Blue Ridge Dam, Ocoee #1 Dam, Ocoee #2 Dam, Ocoee #3 Dam, Raccoon Mountain Pumped Storage Plant, Finley Stadium, Huntsville Botanical Garden, Browns Ferry Nuclear Plant, Guntersville Dam & Lock, and Clear Creek Dam.

The TVA logo is visible in the bottom right corner.

2019 Integrated Resource Plan

Over the next

20



years

Up to

14



GW solar additions (nameplate)

Up to

5



GW storage additions

All portfolios point to a TVA power system that will
be LOW-COST, RELIABLE, and CLEAN



2^{to} 17

GW Natural Gas
Additions

Evaluation of
additional
coal and gas
retirements

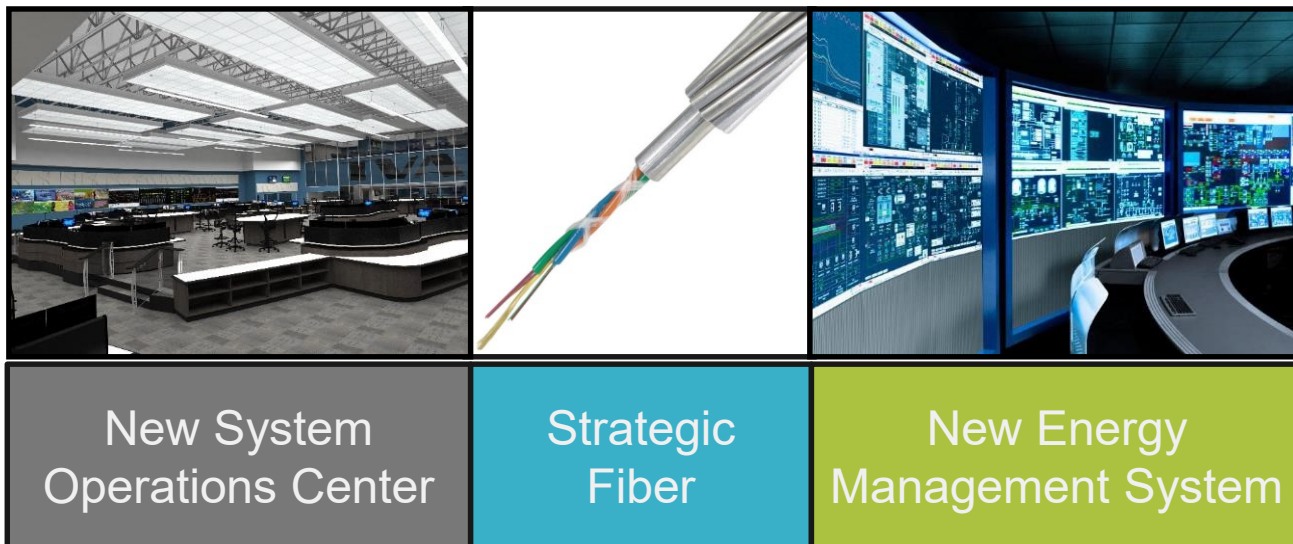


Projected

70%
reduction in
CO₂ Intensity

Average results from 2005 baseline (lbs/MWh)

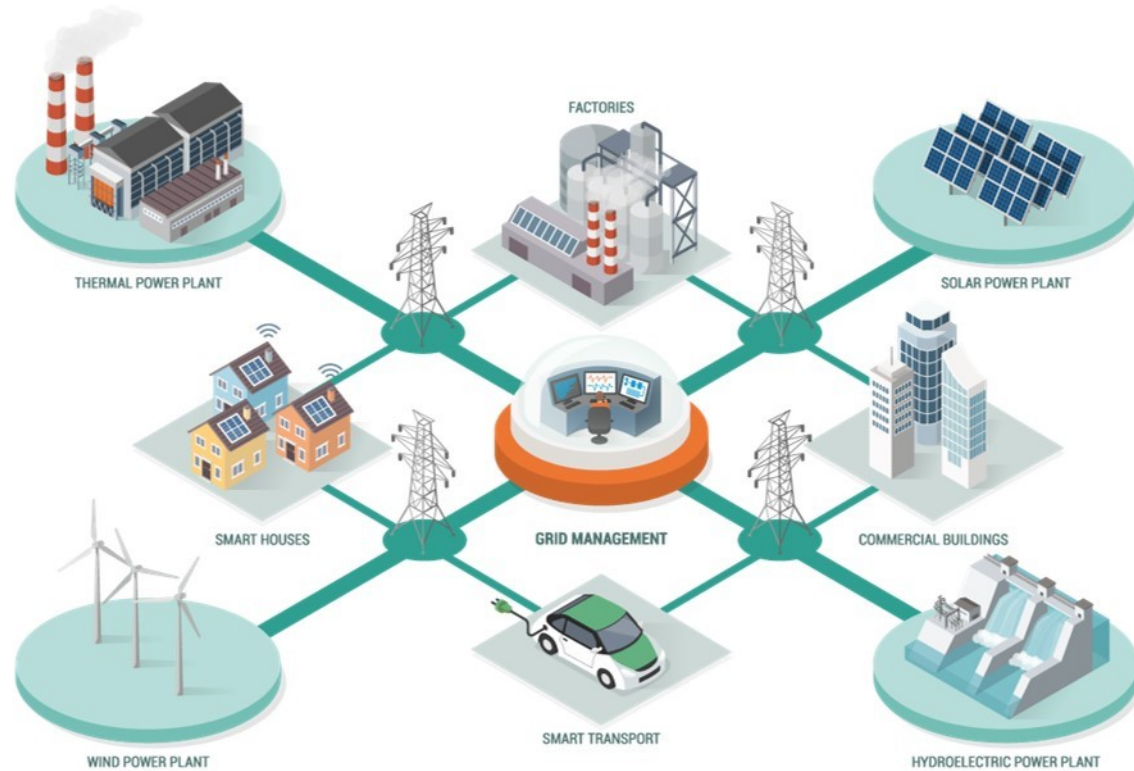
Key Investments in Grid of Tomorrow



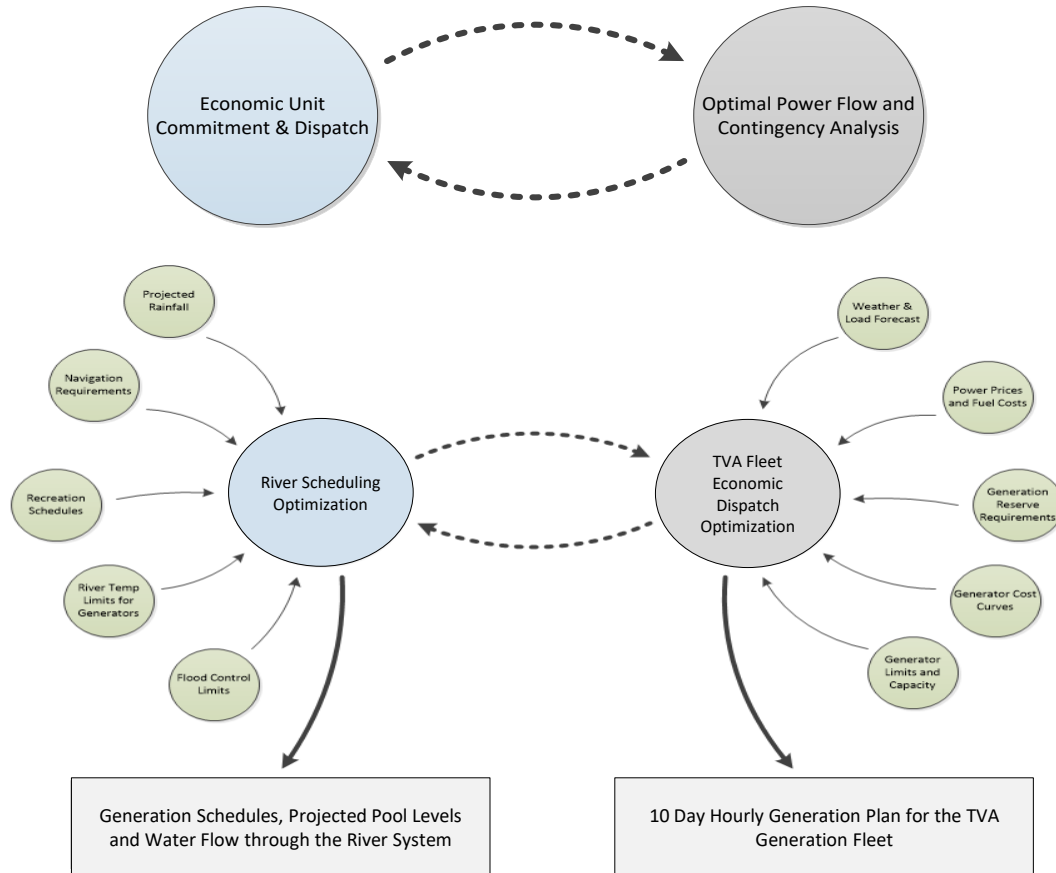
With a \$600M capital investment, the new System Operations Center will use advanced metering in coordination with a robust fiber optic network and a state of the art energy management system to achieve projected savings of \$250M year over year.



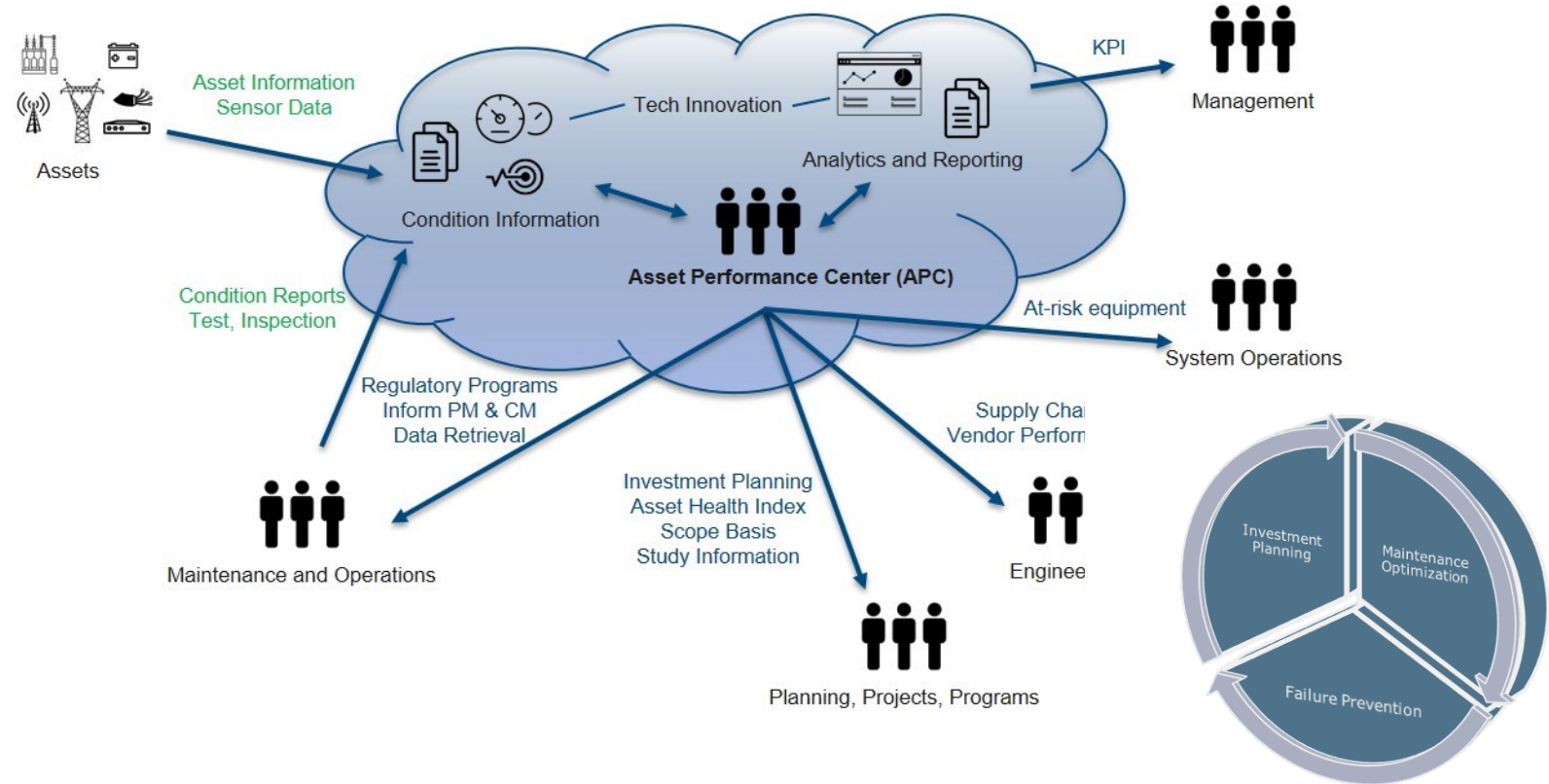
Value of DER Integration



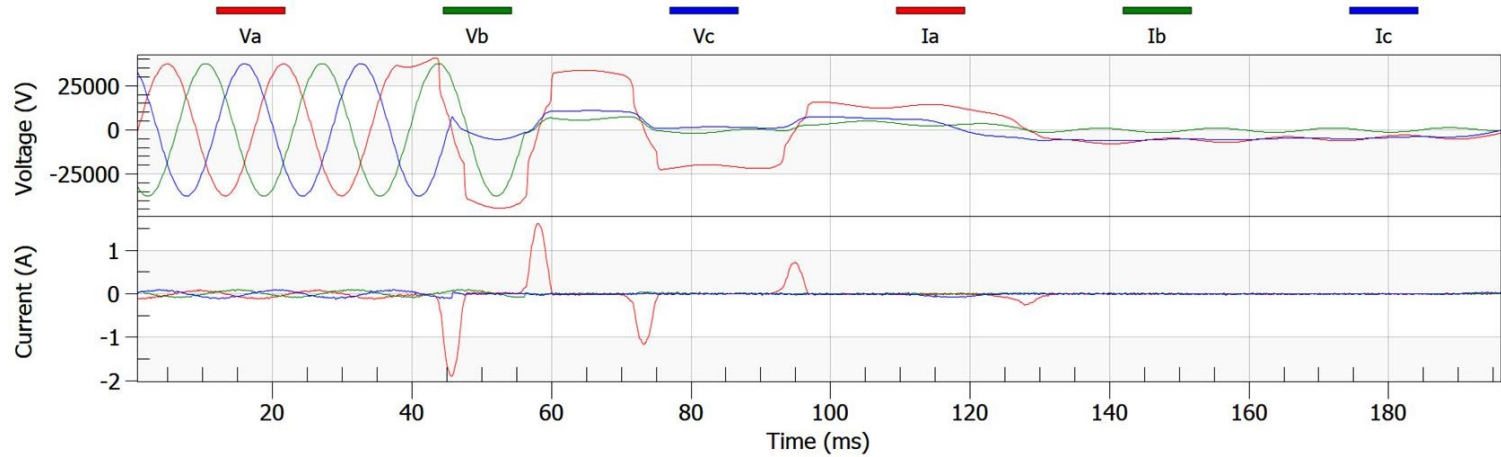
Integrated Optimization



Condition Monitoring - Asset Performance Center

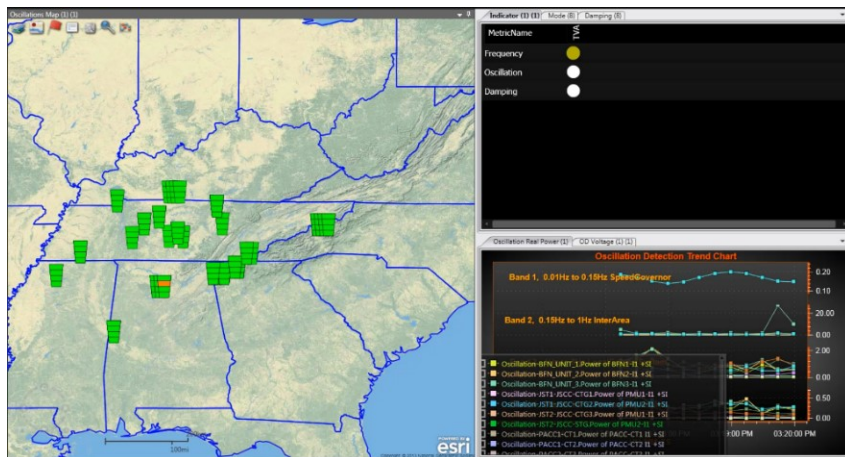


Equipment Failure Detection

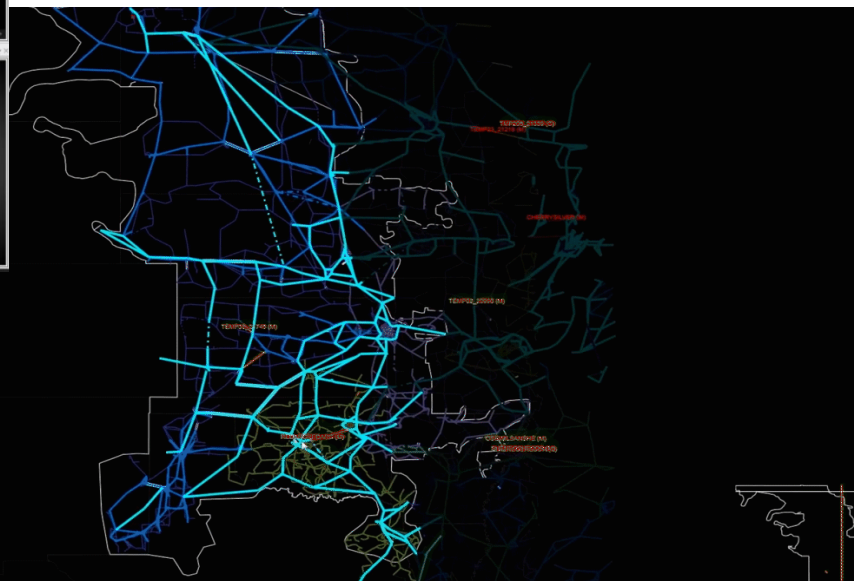


Real Time Visibility and Control

Real Time Dynamic Monitoring System



Advanced Visualization Platform



Drones, Wearables, and Robots



