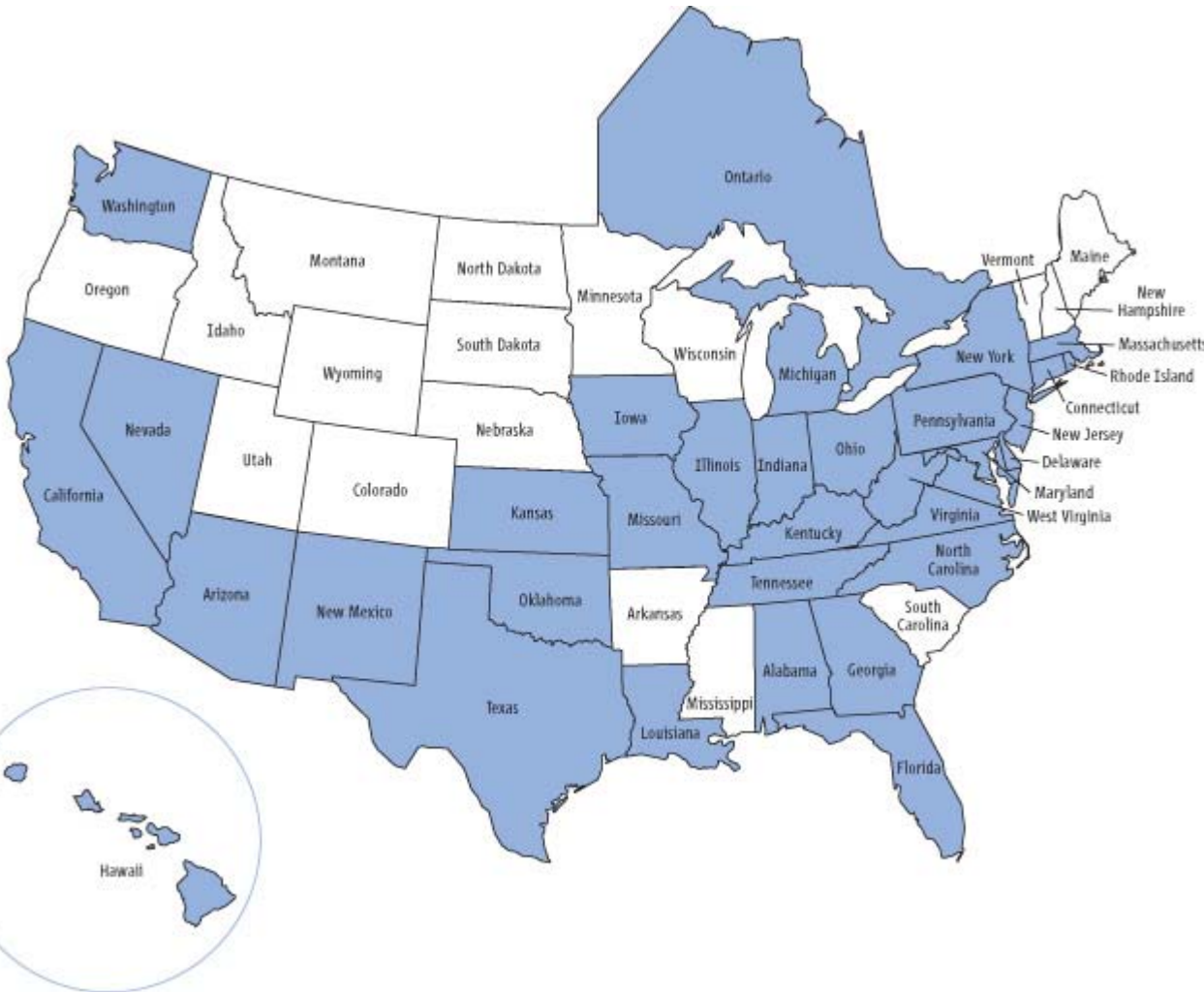


# Interdependencies, Security, and Growing Resource Constraints NARUC Winter Meetings Committee on Critical Infrastructure Washington, D.C. February 17, 2008

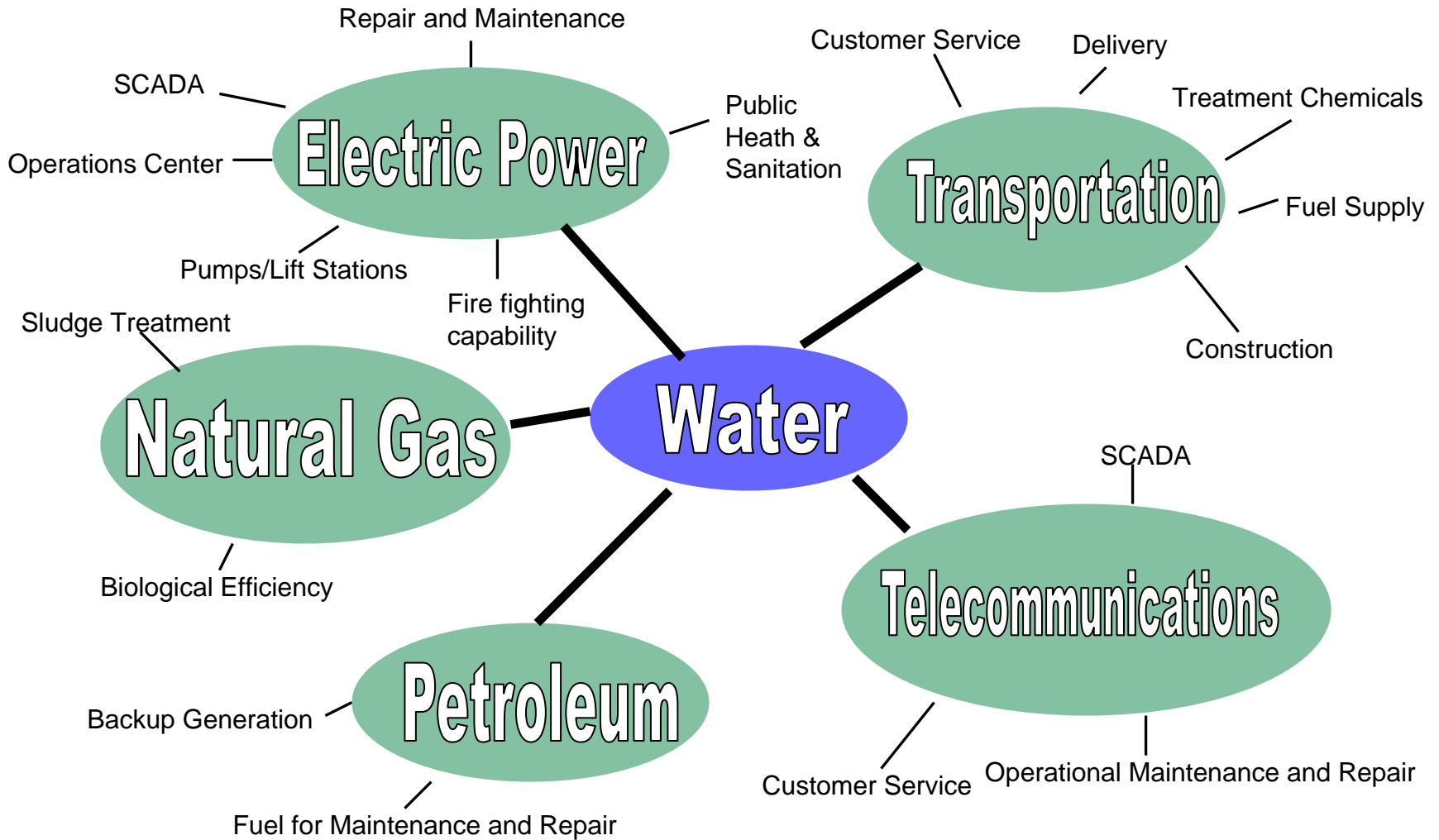
Paul G. Foran  
Vice President Regulatory Programs  
American Water



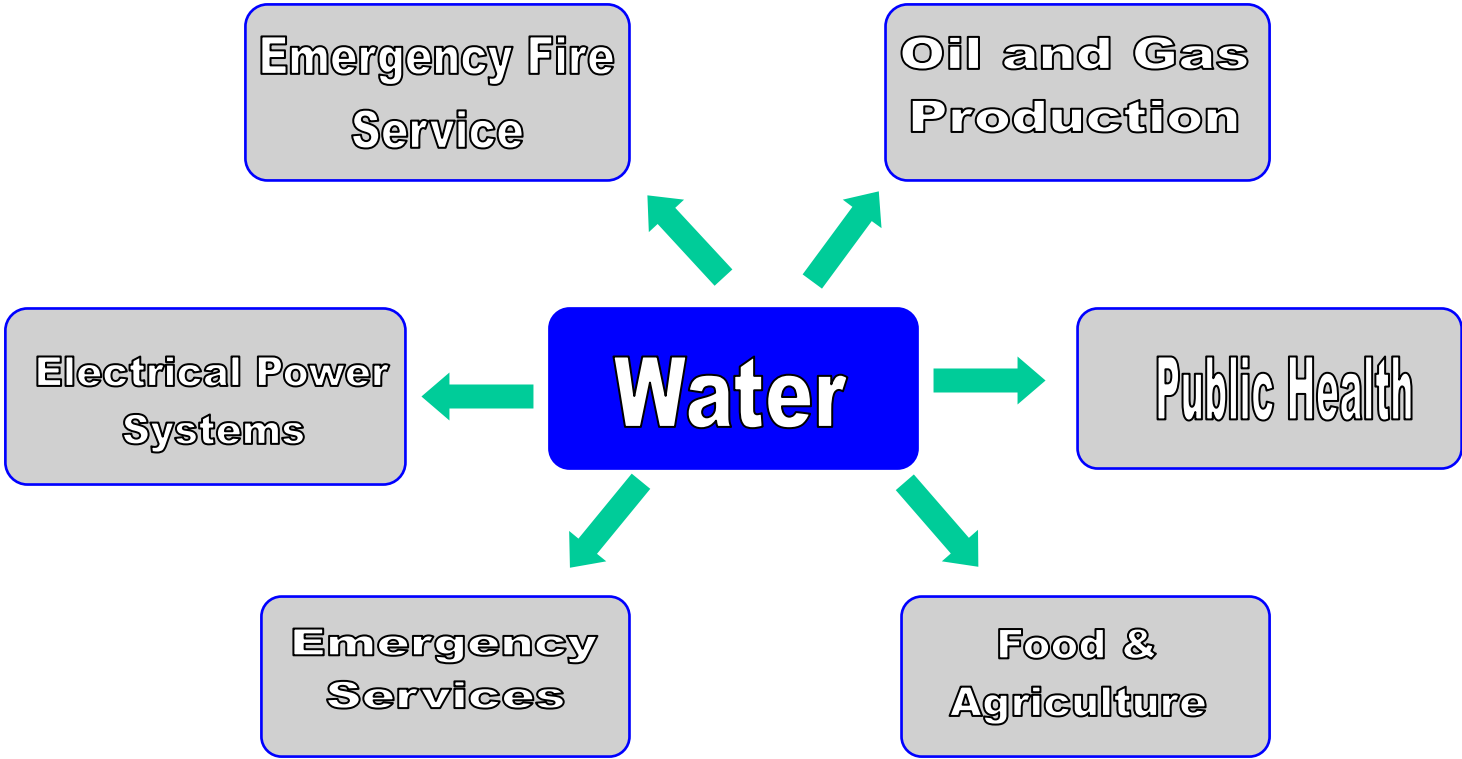
- **Founded in 1886**
- **Largest investor-owned water and wastewater utility in the United States**
- **Serves approximately 16.2 million people**
- **Operations in 32 states and Ontario, Canada**
- **Approximately 7,000 employees**

- Energy is the largest non-labor O&M cost driver (For AW systemwide: approximately 30% of production related expenses)
- Approximately 20% of all energy usage in California is for the treatment and distribution of water
- Significant Greenhouse Gas Emissions (GHGe) footprint (For AW 92.4 of GHGe results from electric energy use; 3.5% from vehicle fuels)

# Water Sector Interdependencies



# Critical Infrastructure Dependencies



- Hardening facilities where appropriate is necessary but there has been a shift from primary focus on avoidance to recovery and sustainability
- Internal Centralization, Coordination, and Professionalization of Security Function
- Importance of and need for Mutual Aid Agreements: not common in the water industry
- Need for more cross sector coordination
- No discrimination in protecting critical infrastructure based on ownership status of facilities ( government vs. private)
- Need to streamline/eliminate normal bureaucratic processes
- Importance of planning/practice

# The Broader Question:

- Interdependencies, drought issues are only two aspects of the broader context of increasing supply constraints and their effects:
  - Water is finite but renewable
- Other impacts
  - Population growth and shift
  - Habitat and ecosystem protection
  - Competing uses (agriculture, recreation, industry, etc.)
  - Global climate change
  - NIMB

# Keys to the Future

- Energy efficiency
  - System-wide energy audits
  - USEPA Climate Leaders Partnership
  - Greater use of technology
- Reuse
  - Wastewater discharges for potable and non-potable domestic use
  - Commercial uses, such as golf courses
  - Residuals handling
- Operational efficiency
  - Leak detection and reduction of non-revenue water
- Technological innovation
  - Desalination and other treatment processes
  - Security

- Integrated Water Resource Management
  - Management of the whole hydrologic cycle to achieve a coherent set of water resource policies and uses that balances all reasonable social, environmental, and economic needs in a sustainable way.
  - Sustainability – “... meeting the needs of the present without compromising the ability of future generations to meet their own needs.”
    - World Commission on Environment & Development

# Canal Road Solar Array



**590 kW ground-mounted photovoltaic system**

**Produces 687,000 kilowatts of energy / year**

**Eliminates 721,245 pounds (327 metric tons) of CO<sub>2e</sub> per year**

# Case Study:

## *The Solaire Green Building – Battery Park City, NY*

- Project Location: New York, NY
- The project provides wastewater treatment and recycling to a new 293-unit apartment building
- Treated effluent is reused for toilets, make-up cooling tower water, and landscape irrigation
- The treatment plant utilizes an advanced membrane bioreactor system to separate water from the waste, providing a high quality effluent
- Performance:
  - **53% reduction in wastewater discharge volume**
  - **40% reduction in potable water consumption**
- Treatment technologies include:
  - Submerged, hollow fiber micro-filtration membranes to remove suspended solids
  - Ultra-violet light to kill pathogenic bacteria



# Anthem Water Campus – AZ



# Case Study:

## *Anthem Water Campus / Arizona American Water*



- Treated **wastewater discharge is recycled as irrigation water** for nearby golf courses and common lawn areas.
- During spring and summer, **nearly all wastewater discharge is recycled.**
- During winter months, water not used for irrigation is directed to **groundwater recharge facility.**
- Facilities include:
  - 7 mgd Potable water treatment plant
  - 3.5 mgd Wastewater treatment plant – treats wastewater to irrigation and recharge standards.
- Technologies (WW treatment): Activated Sludge, Ultra-filtration membrane system

# Monmouth County Shark River Golf Course/New Jersey American Water

- Private/public partnership
- Reclaimed water use



- Treatment plant residuals put to beneficial use rather than sent to landfill.
  - Reduces cost by 10% - 70%
  - Conserves landfill capacity
  - Reduces trucking of waste material