

A SHARED RESOURCE, A SHARED RESPONSIBILITY

Energy and Water

Oklahoma Governor's Water Conference

October 27, 2010

Trish Horn, OGE Energy Corp.

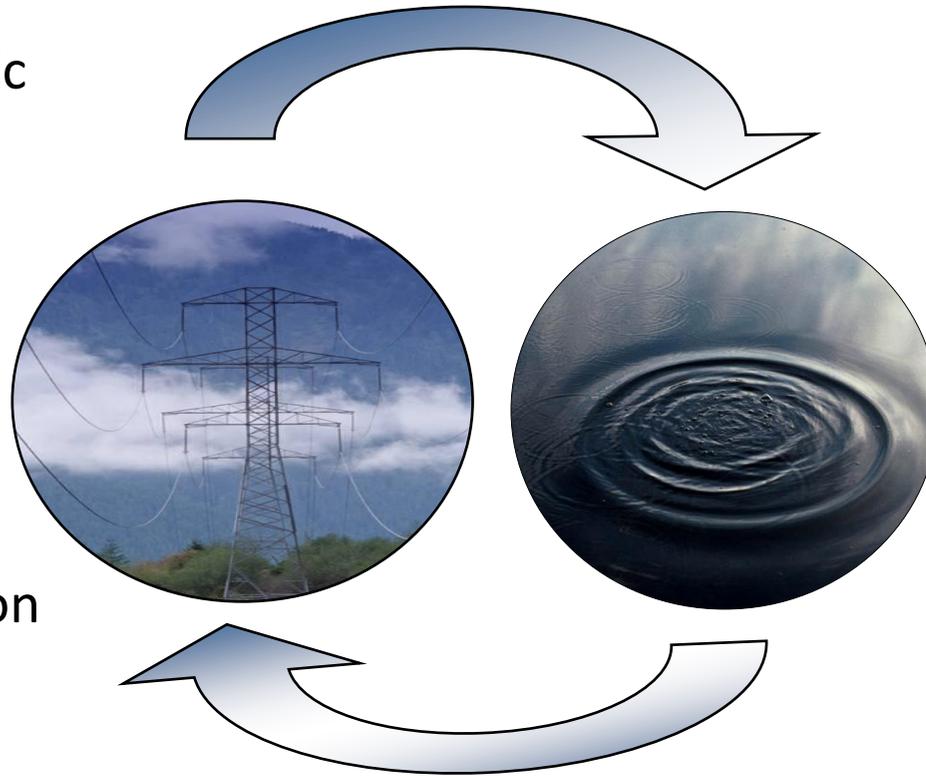
PRESENTATION OVERVIEW

- Energy and water both critical resources that are inextricably linked
- Security and economic health of U.S./Oklahoma depend on maintaining a supply of both electricity and water
- Utility industry is in transformation; changes will affect future amount and type of water needed
- Future energy generation - and its link to water usage and need - depends on a variety of factors
- Employing water stewardship is critical

ENERGY AND WATER ARE LINKED

Energy Requires Water

- Thermoelectric generation (fossil and nuclear)
- Cooling
- Emissions Control
- Fuel Production
- Hydropower
- Minerals Extraction



Water Requires Energy

- Water production, *processing*, distribution and end-use needs
- Pumping
- Conveyance and Transport
- Treatment

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

TRENDS – ENVIRONMENT AND BEYOND

- Electric industry in transformation
- Electric demand predicted to grow substantially (21% by 2030)
- New customer efficiency, renewable energy and service options and programs
- Environmental regulation implications
 - Coordination/impacts/rationale
 - Timing to plan
 - Technology availability/cost
- Challenge: supply affordable, reliable electricity

ENERGY AND WATER

- Availability and cost of one of these resources directly affects the other
- Increased demand for both
- Energy independence is critically linked to water availability
- Critical challenges – Security
 - Population growth, urbanization, regulation, climate change debate, demographic changes

WATER – ELECTRICITY LINK

- Water supply and reclamation consumes 4 percent of U.S. electric power generation
 - Approx 42 GW or 32 million homes
- 75 % of cost of municipal water processing and distribution is for electric power
- Up to 20% of electricity consumed in western states (arid) is used for water infrastructure

WATER WITHDRAWALS, MWh GENERATED AND EFFICIENCIES

EPRI July 2009

	1950	1960	1970	1980	1990	2000
Withdrawals (billion gal)	14,500	36,500	62,100	77,000	71,000	71,000
Power Generated (billion MWh)	0.23	0.61	1.28	2.00	2.68	3.45
Water Withdrawal Efficiency (gal/MWh)	63,000	60,000	49,000	39,000	27,000	21,000

- Industry has reduced water withdrawal per unit of electricity by a factor of 3
- Energy output has increased by a factor of 15
- Net water withdrawal level since 1980

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

ELECTRICITY GENERATION WATER USE

**POSITIVE
ENERGY
TOGETHER®**

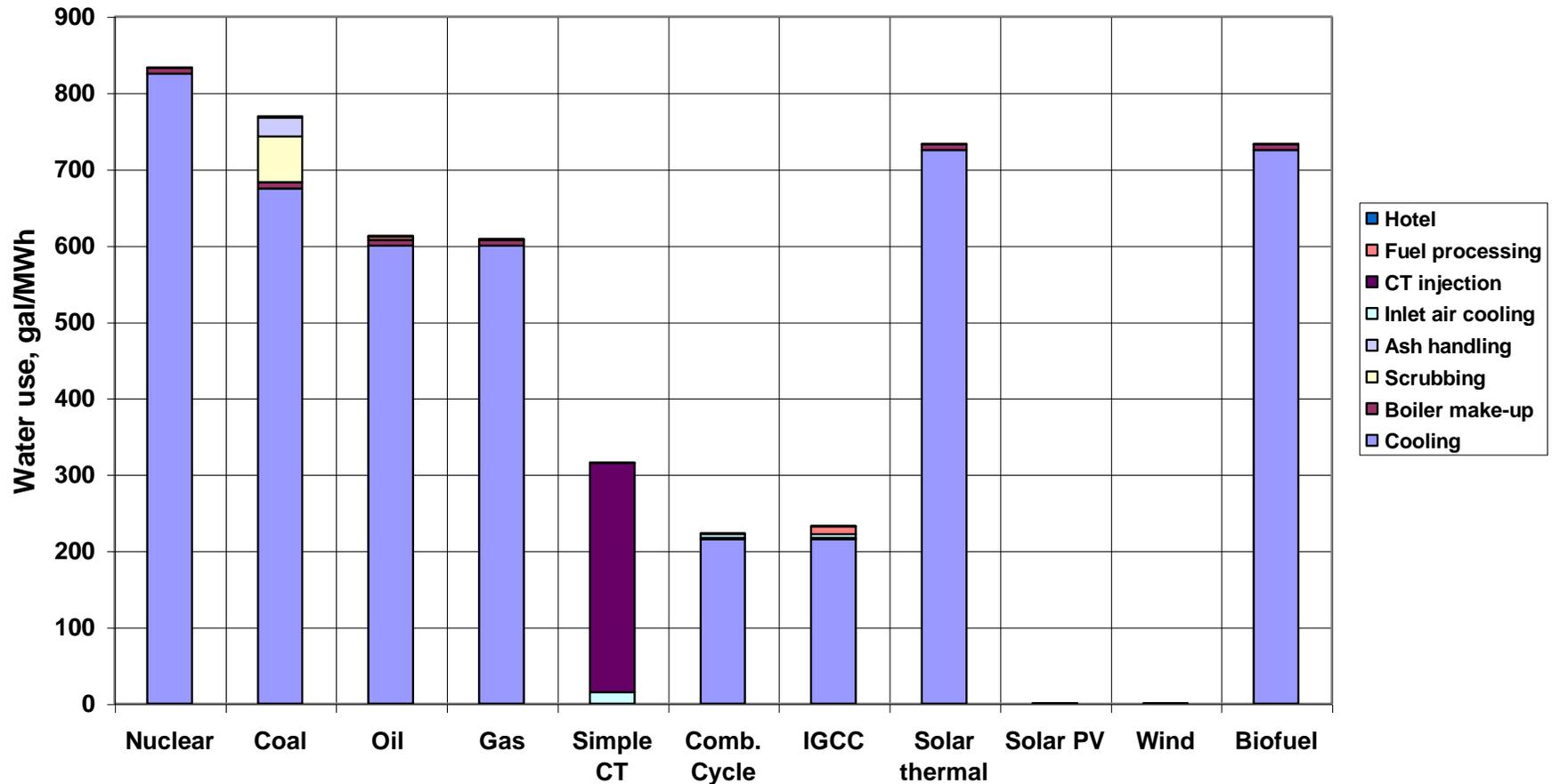
- Cooling
- Environmental control
- Ash handling
- Turbine performance enhancement
- Fuel processing
- Boiler/reactor makeup water
- Housekeeping



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

TYPICAL WATER REQUIREMENTS

Water Use by Plant Type

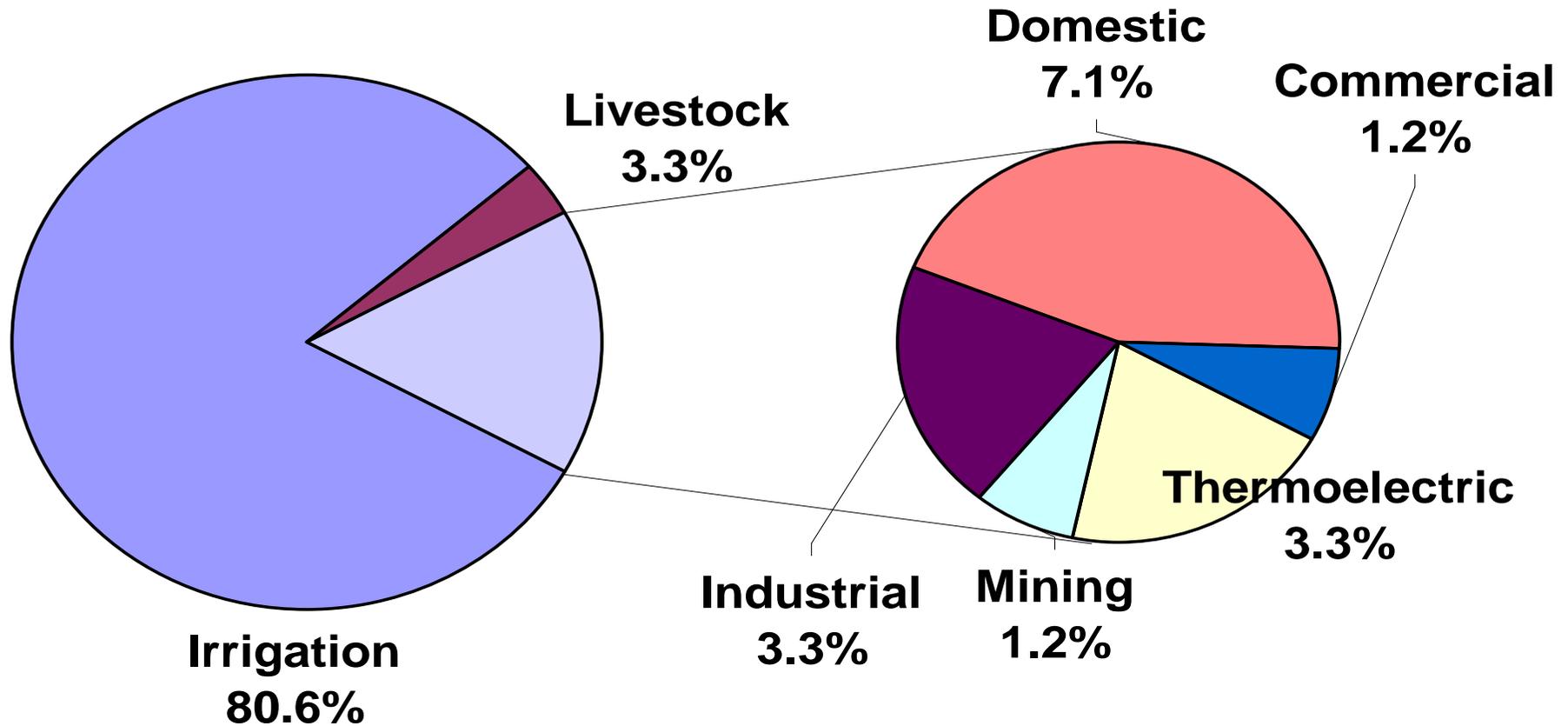


EPRI 2008

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

WATER CONSUMPTION BY SECTOR

U.S. Freshwater Consumption, 100 Bgal/day



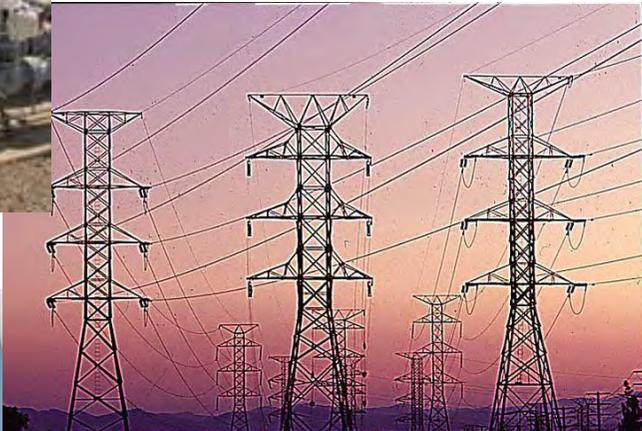
Utility Industry – approx 3% of water consumed

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OGE Energy Corp. (NYSE: OGE)

**POSITIVE
ENERGY
TOGETHER®**

WHO WE ARE



OGI-E®



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

LOCATION OF OGE FACILITIES

POSITIVE
ENERGY
TOGETHER®

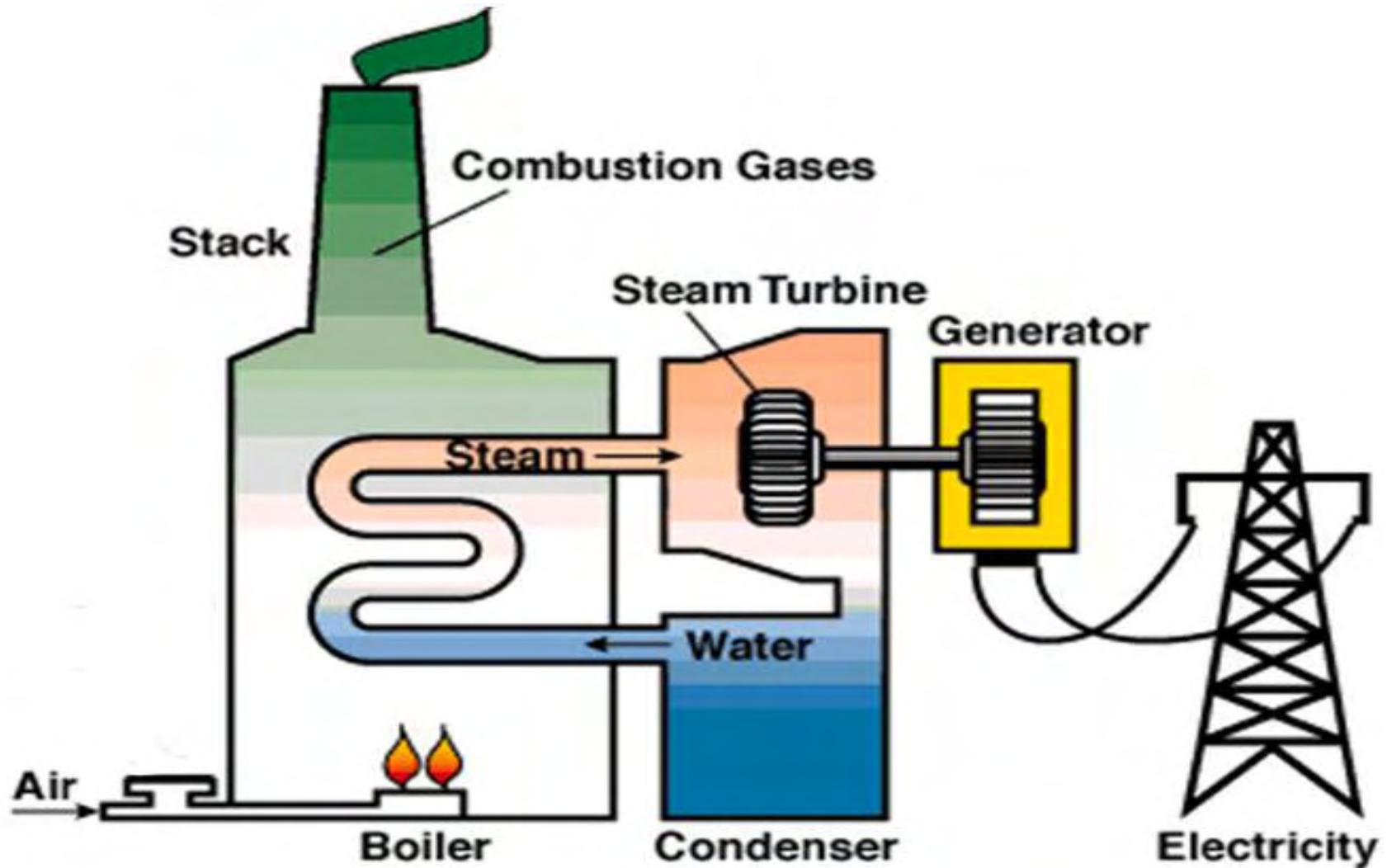
Electric Utility and Natural Gas Pipeline

OG&E



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

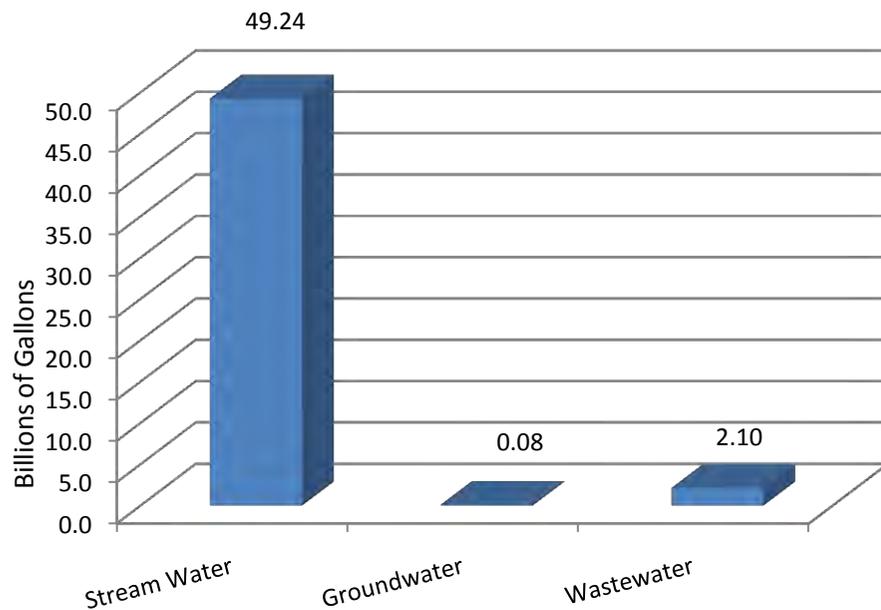
OUR INTEREST IN WATER



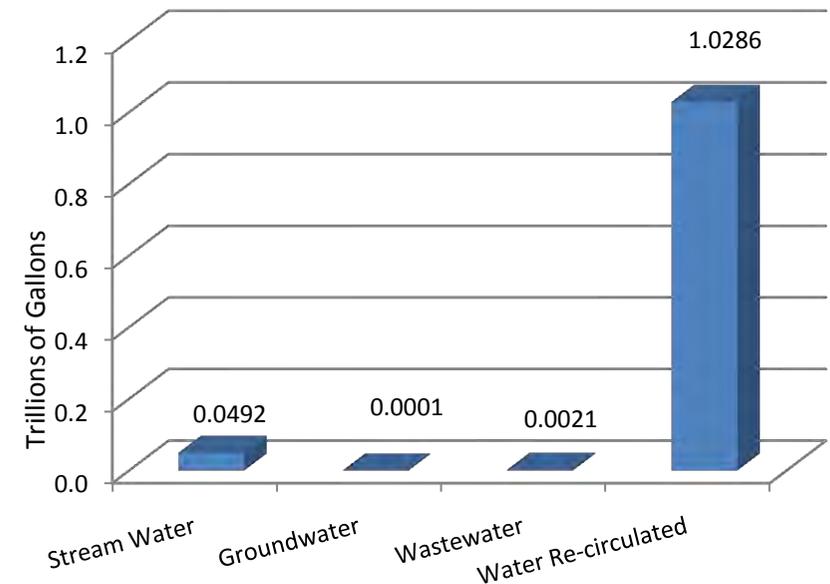
WITH ALL YOUR POWER  WHAT WOULD YOU DO?

2009 OG&E WATER USAGE/RECYCLE COMPARISON

2009 OG&E Water Usage

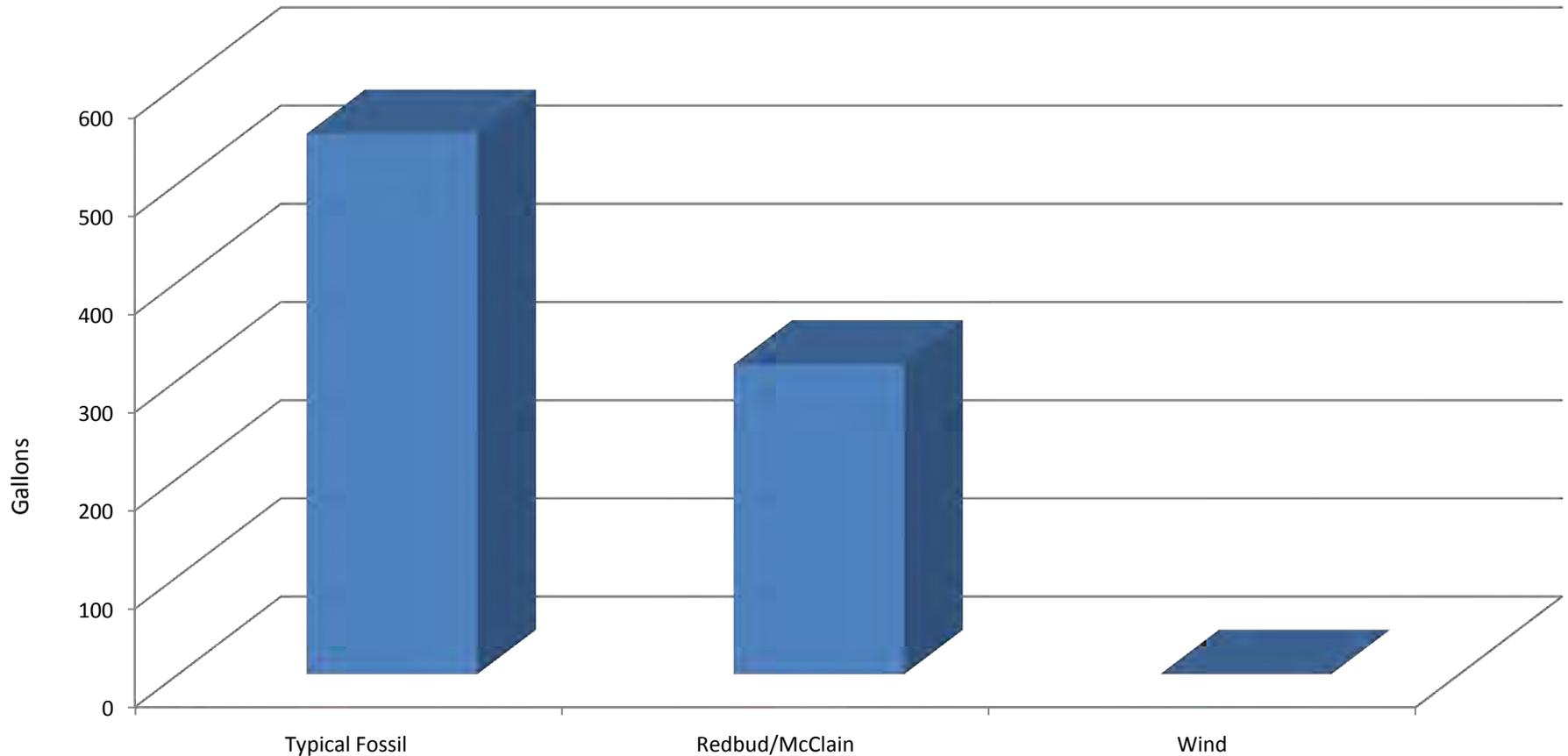


2009 OG&E WATER USAGE /RECYCLE



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OG&E- WATER USAGE - ELECTRIC GENERATION COMPARISONS



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OG&E COOLING WATER -REUSE

In 2009 two facilities used approximately 2.1 billion gallons of treated municipal wastewater as cooling water.

McClain

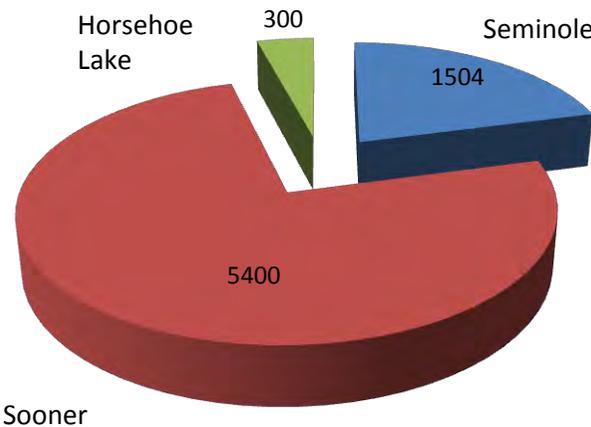


Redbud

OG&E WATER DIVERSITY



OG&E'S Seminole Generating Station Lake Konawa



OG&E's Sooner Generating Station Sooner Lake



OGE 2020 PLAN

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OGE 2020 PLAN

**POSITIVE
ENERGY
TOGETHER®**

- Implemented plan to defer new capacity required until after 2020
- Research/ monitor generation technologies
- Deploy energy efficiency/load curtailment programs
- Build wind to extent supported by economics – today commitments equal 11% of capacity
- Deploy Smart Grid to drive:
 - Demand Response – 5% reduction 2020
 - Energy efficiency
 - Distributed generation/storage
 - Increase customer satisfaction, options and cost savings

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OG&E's Wind Development

OG&E – WIND DEVELOPMENT

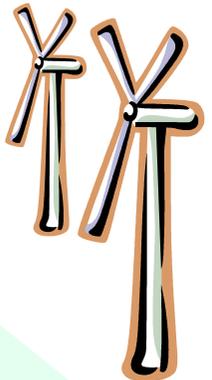
1 Construct Transmission Lines



- Needed to deliver wind energy to load centers
- Enhanced reliability of regional grid

2 Add Wind Generation

- Hedge against changing fuel prices
- Environmental benefits



3 Offer Customers “Renewable” and energy management programs

- Provide customers “green” option
- Means to offset rising costs

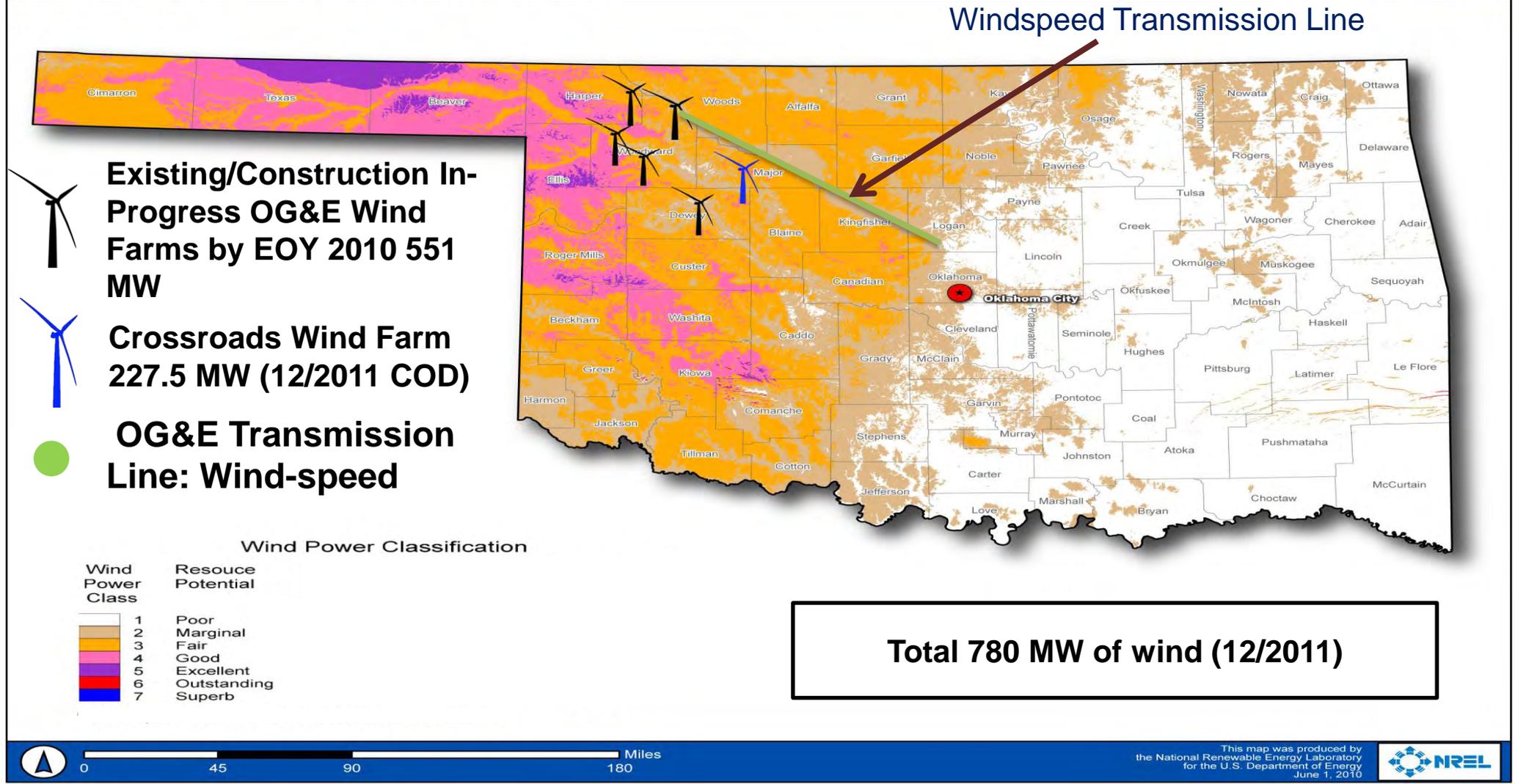


OKLAHOMA WIND POTENTIAL

**POSITIVE
ENERGY
TOGETHER®**

50 m Wind Power Resource

Oklahoma



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OG&E's Positive Energy Smart Grid

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

OG&E SMART GRID RATIONALE

**POSITIVE
ENERGY
TOGETHER®**

- Empower customers with the information and tools necessary to better manage their individual energy usage and costs
- Create opportunities to reduce higher cost, peak energy consumption as well as the need for additional fossil-fueled power plants
- Reduce utility operating costs while improving the ability to respond to customers
- Improve the ability to anticipate, manage, and respond to outages and other system disturbances

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

Customer Programs

New In-Home Technologies



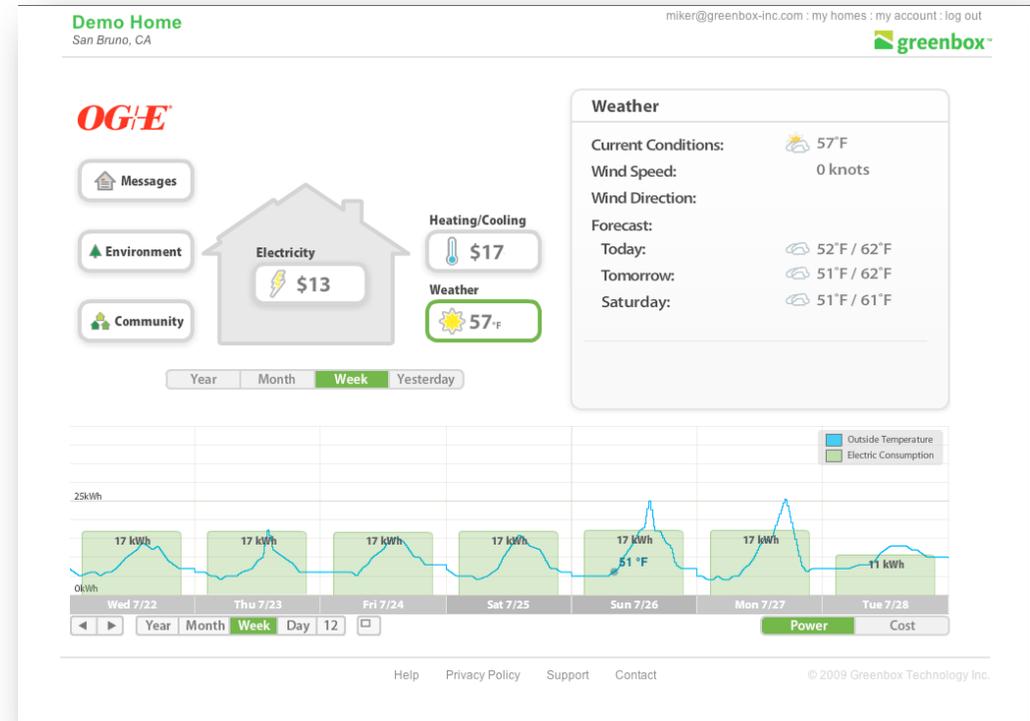
**POSITIVE
ENERGY
TOGETHER®**



Smart Thermostat



In Home Display

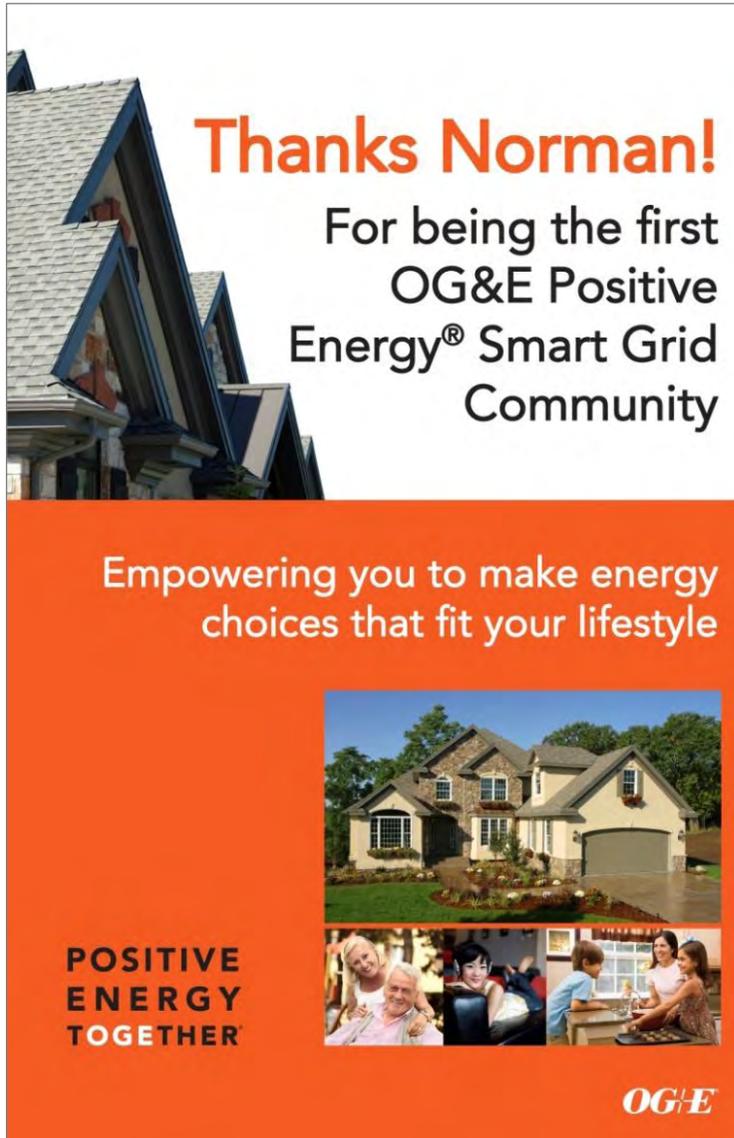


Customer Web Portal

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

Smart Grid Timeline

POSITIVE
ENERGY
TOGETHER®



Thanks Norman!
For being the first
OG&E Positive
Energy® Smart Grid
Community

Empowering you to make energy
choices that fit your lifestyle



POSITIVE
ENERGY
TOGETHER

OG&E

2008: 6,600 Smart Meters installed in Northwest Oklahoma City

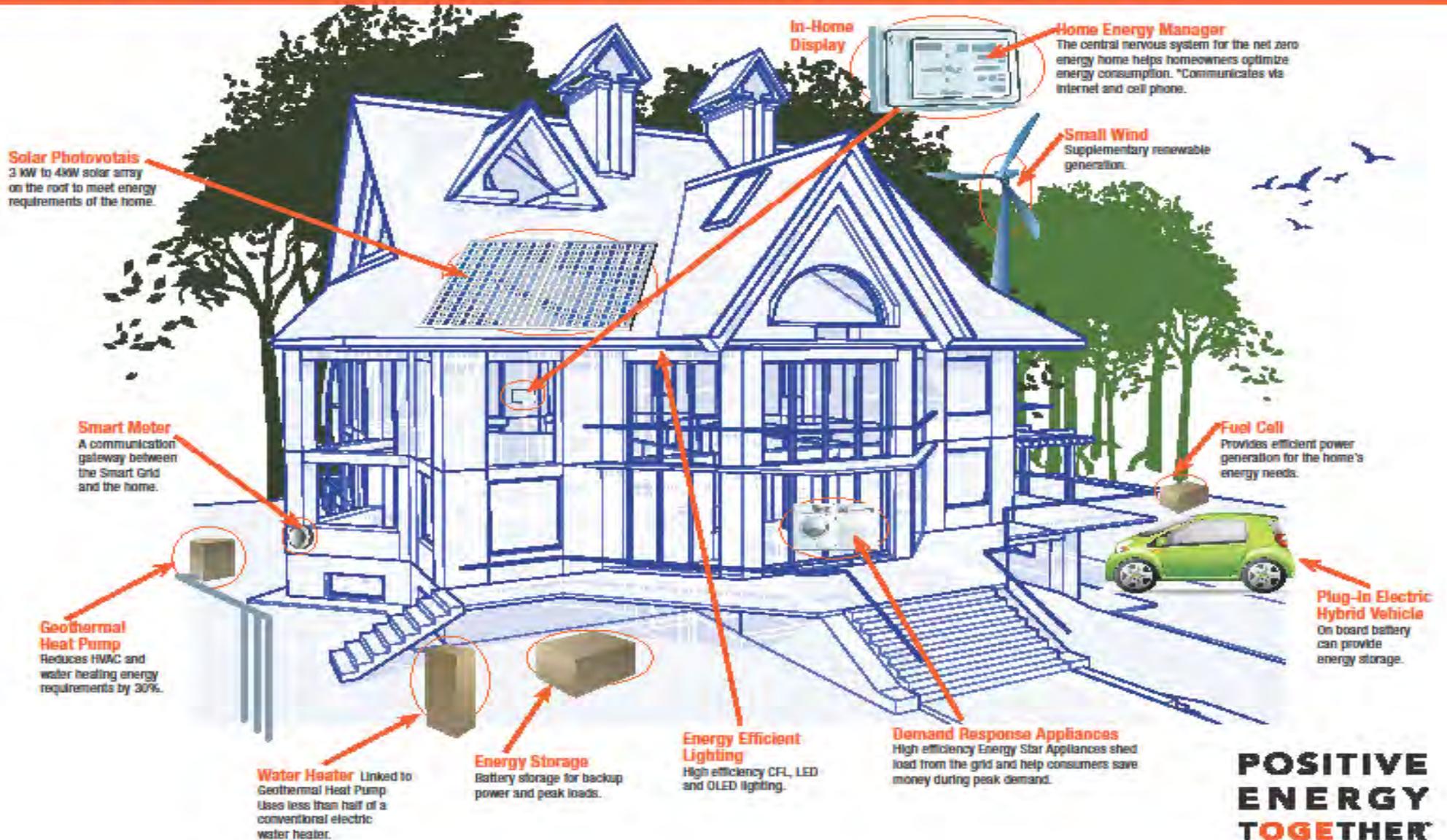
2009: OG&E awarded \$130 million in federal stimulus money to build *Positive Energy™ Smart Grid* across OG&E's Oklahoma service territory

2010: Over 100,000 smart meters have been installed

2011+: Roll out Smart Meters to all OG&E Oklahoma customers

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

A view of a customer's Positive Energy Home in 2020



WITH ALL YOUR POWER  WHAT WOULD YOU DO?

WHAT OG&E IS DOING ...

- Water Stewardship
 - Conservation of fresh water
 - Recycle/Reuse
 - Employing uses for waste water
 - New generation – more efficient water usage
 - Public uses of cooling lakes – recreation/wildlife
- Installing Smart Grid
 - Empowering customers with information to make energy choices that conserve and are efficient
- Providing Programs for Energy Conservation
 - Less energy used – less water required
- Expanding Renewable Energy



IN CONCLUSION – WATER AND ENERGY

**POSITIVE
ENERGY
TOGETHER®**

- A reliable water supply source is indispensable to OG&E and the citizens of Oklahoma
- A reliable and affordable source of electricity is vital to a good quality of life for Oklahoma
- By partnering and working together, we can make energy choices and decisions that conserve and protect our valuable water resources
- OGE wants to empower you to make energy choices that are good for you, good for our Oklahoma water plan and good for Oklahoma.

WITH ALL YOUR POWER  WHAT WOULD YOU DO?

**WATER AND ENERGY
SHARED RESOURCE – SHARED RESPONSIBILITY**

WITH ALL OUR POWER WHAT CAN WE DO TOGETHER?

WITH ALL YOUR POWER  WHAT WOULD YOU DO?