Energy Efficiency
For Better Air Quality
Reducing Air Pollution and Restoring Scenic Beauty
Overview

01 | Air Quality in Arkansas
   • “Energy-use” Pollutants
   • Air Planning at DEQ

02 | Quantifying EE Air Benefits
   • AVoided Emissions and geneRation Tool (AVERT)
   • Benefits-per-Kilowatt-Hour Tool (BPK)

03 | Wrap-Up

Buffalo National River, Arkansas
Image Credit Arkansas Department of Parks and Tourism
Air Quality in Arkansas

Energy Efficiency = Cleaner Air
Thank YOU, and YOU...!
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✔️ **Energy Efficiency = Real Air Quality Benefits**
  Averted generation means lower emissions of **all** air pollutants

✔️ **National Ambient Air Quality Standards (NAAQS)**
  Averted generation gives “bonus” reductions for Air Planning

✔️ **Regional Haze Program**
  Averted generation included in Arkansas’s 2021 Regional Haze Plan
Statewide Averages Compared to Federal Standards for “Energy” Pollutants

- Annual Nitrogen Dioxide
- 1-Hour Nitrogen Dioxide
- 1-Hour Sulfur Dioxide
- Annual Fine Particles
- 24-Hour Fine Particles
- 8-Hour Ozone

Risk Levels:
- Good
- Cautionary
- Risk of Exceedance
What if Arkansas Exceeds a Federal Standard?

✔ **EPA Designates Non-Attainment Status**
  Based on an area exceeding one or more pollutant limits

✔ **State Must Submit Non-Attainment State Plan**
  New regulations, permit conditions and limits, & area strategies

✔ **State Must Demonstrate Attainment**
  - Monitoring and modeling used to demonstrate attainment
  - Once demonstrated, must submit a Maintenance Plan, closely monitor (Two 10-year periods)
Air Pollution = Ozone

Image Credit: Harris County, TX
Air Pollution = Haze

Caney Creek Wilderness– WinHAZE 2015 Modeled Visibility Conditions

- Sulfates, nitrates, and other particles reduce visibility and affect health
- Visibility in scenic areas is important to visitors, local economies
Regional Haze Program

- **Goal:** Achieve natural visibility conditions by 2064
- 156 designated scenic areas
- Federal, state, & tribal partnership
- Plans cover 10-year periods

Photo Credit: Tricia Treece
Quantifying Air Benefits from Energy Efficiency
Energy Savings → Emission Reductions

• Savings determined by AVERT Region

• AVERT
  • Predicts magnitude & location of emission reductions in
  • Outputs compatible with air quality models
DEQ Method for EE Accounting

- Projected Energy Savings for 2018 – 2028 Haze Planning Period
- Modeled Emission Reductions using AVERT

Arkansas is the 1st in the nation to include EE in Regional Haze planning!
Projected Energy Savings

(Based on PSC Targets, not Actuals, which EXCEED Targets!)

Energy Savings (GWh)

Continued Savings from Past Measures

Incremental Savings

Data from 2010-2017 EE Annual Reports filed with PSC by Entergy, SWEPCO, OGE, and Empire was used for projections 2018-2028: [http://www.apsccservices.info/AnnualReport.asp](http://www.apsccservices.info/AnnualReport.asp)
2028 Southeast AVERT Results – SO$_2$

Circle size is proportionate to magnitude
EPA used existing tools and expert input to develop the BPK values.

**Energy Savings → Health Benefits**

- **Wind**: 100 MW
- **Solar**: 100 MW
- **Uniform EE**: 500 GWh
- **Peak EE**: 2000 GWh (12-6 pm weekdays)

**Scenarios**

- Estimate changes in electricity generation
- Estimate changes in emissions of $NO_X$, $SO_2$, and primary PM$_{2.5}$

**COBRA**

- Regional factors (c/kWh) for estimating the monetized health benefits of kWh saved through EE or generated through RE

**AVERT**

- Estimate air quality changes (primary and secondary PM$_{2.5}$)
- Estimate dollar value of public health benefits

**Health Benefits per kilowatt hour**

MW: Megawatt  GWh: Gigawatt-hour
2018-2028 EE Projection
BPK Results

2018-2028 Cumulative Energy Efficiency Health Benefits for Arkansas

$ Health Savings LOW
(1.4 cents to 2.7 cents per kWh)

$ Health Savings HIGH
(3 cents to 6 cents per kWh)
Wrap-Up
Conclusions

- EE delivers quantifiable non-energy benefits for air quality
- Our collaboration with your EE efforts has benefited the state
- Arkansas is leading state in demonstrating air quality benefits from EE

We welcome future collaboration and are happy to support your efforts in EE!
Resources

Arkansas E&E DEQ
• Accounting for Energy Efficiency Measures in Regional Haze Planning Concept Paper

Regulatory Assistance Project
• Using Energy Efficiency to Advance Air Quality Compliance
• Purple Haze, or Purple Mountain Majesties? How Energy Efficiency can Reduce Regional Haze

EPA
• Energy Resources for State, Local, and Tribal Governments
• Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans
• Estimating the Health Benefits per Kilowatt-hour of Energy Efficiency and Renewable Energy
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org
Questions?
Thank you!

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