

Draft – For Workgroup Review and Comment

ENERGY OUTLOOK WHITE PAPER

TABLE OF CONTENTS

I. Purpose

In order to attain the federal air quality standards of ozone and PM_{2.5}, and to achieve the state's GHG reduction targets, transformational changes to how we select and use energy sources are essential. The Energy Outlook Workgroup has been assembled to develop a white paper that provides insight and analysis on a range of topics that impact the energy sector within the Basin. The range of topics and analysis will, in part, cover:

- Review energy choices on the AQMP planning horizon;
- Identify potential demand, supply, and infrastructure needs for energy sectors based on existing regulations, policies, and programs;
- Review emerging technologies that impact efficiency and reliability;
- Scenario analysis based on input from other working groups for various energy sectors;
- State of the Basin's energy infrastructure;
- Identify actions needed for coordinated efforts among the public agencies, fuel providers, and consumers for the scenarios analyzed.

II. Background

- a. Energy use profile
 - i. Energy use by sector (Residential, Commercial, Transportation, Industrial)
 - ii. Energy use by fuel type
- b. Emissions by Sector and Fuel Type
 - i. NO_x emissions
 - ii. GHG Emissions

III. Existing Programs, Regulations, and Planning Efforts Potentially Impacting Energy Use and Infrastructure

This chapter reviews regulations, policies, planning documents, tax credits, and incentives along with implementing agencies that impact current and future energy usage.

- a. Federal (e.g. Clean Power Plan, Transportation Targets, Tax Credits)
- b. State (e.g. AB 32 targets and regulations, Ca Water Plan, IEPR)
- c. Local (e.g. AQMP, RTP, AB2766)

IV. Evolving Energy Landscape

This Chapter provides an overview on the changing energy landscape within the Basin as a result of the Existing Programs (Ch. 3) and unexpected infrastructure changes.

- a. Liquid Fuels
 - i. Projection based on existing programs (e.g. LCFS, Cap and Trade)
 - ii. Bio-fuels
- b. Electricity
 - i. Projections based on existing programs
 - ii. Impact of San Onofre
 - iii. Grid needs from RPS (e.g. intermittency, “Duck Curve”)
 - iv. Incorporating transportation sector
- c. Natural Gas
 - i. Review of potential impact of existing programs
 - ii. Storage needs or preventing curtailment (if any?)
 - iii. Incorporating transportation sector
 - iv. Bio-gas
- d. Other Energy Choices (e.g. Hydrogen)
 - i. Projections
 - ii. Generation, distribution, and end uses
 - iii. Impact on other energy choices

V. Emerging Technologies

Chapter will provide an overview of new technologies within energy sectors that might impact or benefit energy infrastructure, transportation energy needs and increase energy choices.

- a. Summary
 - i. Introduction of new technologies
 - ii. Increasing cross sectional energy uses
- b. Liquid Fuels
 - i. New zero and near-zero transportation, goods movement, and off-road technologies
 - ii. Infrastructure needs
 - iii. Other roles zero and near-zero mobile technologies might have (i.e. grid services, backup power)

- c. Electricity
 - i. Zero and near-zero distributed generation technologies
 - ii. Technologies to help increase renewable generation (e.g. over generation, intermittency, ramp rates)
 - iii. Infrastructure needs (e.g. transportation, combined heat & power)
- d. Natural Gas
 - i. Incorporating biogas and/or hydrogen
 - ii. Coupling with electrical grid needs
 - iii. Increasing Combined Heat and Power
 - iv. Infrastructure needs (e.g. transportation)
- e. Other Energy Choices (e.g. Hydrogen)

VI. Scenario Analysis

The Scenario analysis will review scenarios with input from other white paper workgroups to provide air quality benefits in different sectors.

- a. Scenario development
 - i. Emissions Impacts (boundary conditions)
 - ii. Impact on Energy Choices
- b. Methodologies
- c. Scenario Review

VII. Infrastructure Assessment

This chapter provides a summary of the existing and future energy infrastructure needs in the Basin based on current path forward and needs identified during scenario review.

- a. Liquid Fuels
 - i. Summary of current infrastructure
 - ii. Future infrastructure needs
 - iii. Impacts from Scenario Analysis
- b. Electricity
 - i. Summary of electrical utilities in Basin
 - ii. Future infrastructure needs
 - iii. Impacts from Scenario Analysis
- c. Natural Gas
 - i. Utility summary and statistics
 - ii. Future infrastructure needs
 - iii. Impacts from Scenario Analysis
- d. Other Energy Choices (e.g. Hydrogen)

VIII. Findings and Recommendations for 2016 AQMP

This chapter will summarize the most important findings from this review that could be pursued and/or further developed for the 2016 AQMP.

- a. Summary of Findings
 - i. Limitations or deficiencies of existing programs
 - ii. Recommended Collaborative Efforts

- b. Opportunities the 2016 AQMP could pursue
 - i. Coordinated Efforts with other agencies
 - ii. Others?

Acronyms

References

Appendices