U.S. Department of Energy
Energy Efficiency and Renewable Energy

Energy Conservation Standards for Commercial Unitary Air Conditioners and Heat Pumps

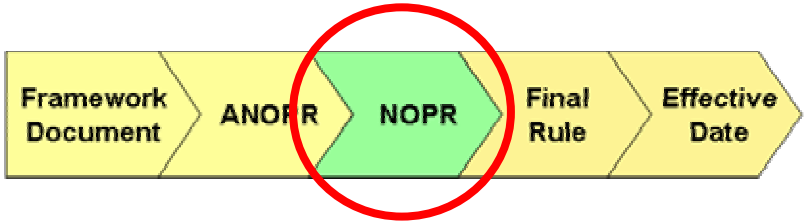
ANOPR Public Meeting

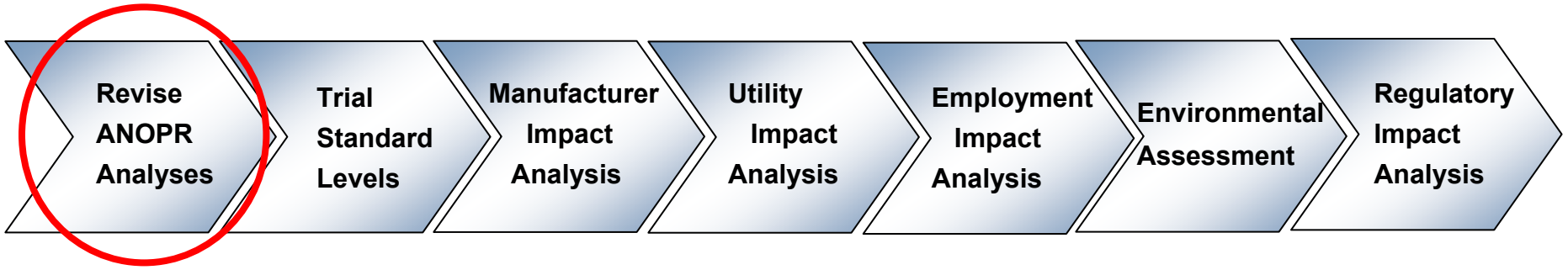
NOPR Analyses and Next Steps

Building Technologies Program
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

September 30, 2004

NOPR Analyses Flow Diagram





Revise ANOPR Analyses

ANOPR Analysis	Action
Engineering Analysis	• Consider ANOPR comments • Revise using latest data
Life-Cycle Cost and Payback Period Analyses	• Consider ANOPR comments • Revise using latest data • Conduct LCC Sub-Group Analysis
National Impacts Analysis	• Consider ANOPR comments • Revise using latest data

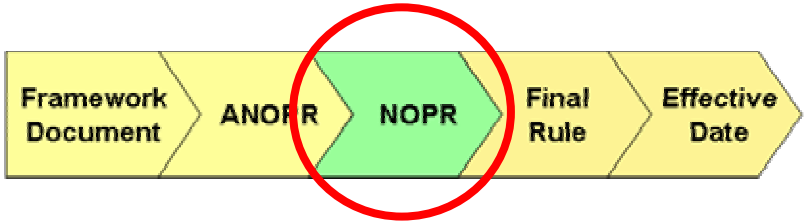
Customer Sub-Groups (ANOPR Issue #14)

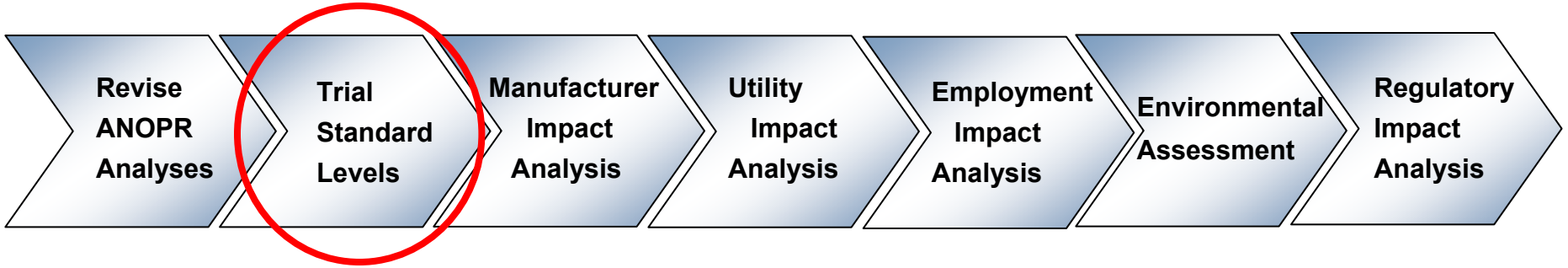
Smaller businesses have been identified as a possible sub-group to be analyzed for the NOPR in the LCC Sub-Group Analysis.

The Department does not have annual revenues for businesses in the buildings analyzed in the LCC analysis.

The Department seeks comments on building characteristics that can be used as an indicator of annual revenues in order to identify smaller businesses.

NOPR Analyses Flow Diagram





Selection of Trial Standard Levels

- **Purpose**
  - To develop a list of standard levels from which impacts are weighed and a proposed standard level is selected
    - Each trial standard level consists of a set of potential minimum efficiency levels covering all product classes, and may vary between product classes
    - NOPR analyses assess impacts for trial standard levels (not product classes)
- **Method**
  - Trial standard levels are assembled from the product classes identified in the ANOPR
    - Candidate standard levels cover a range of efficiencies including:
      - Most energy efficient level (max tech)
      - Efficiency level with the lowest life-cycle cost
      - Efficiency level with a payback period of three years or less
      - Efficiency levels with noteworthy technologies
      - Efficiency levels that fill in large gaps between candidate standard levels
    - Each trial standard level consists of the candidate standard level from each product class that meets one of the above criteria

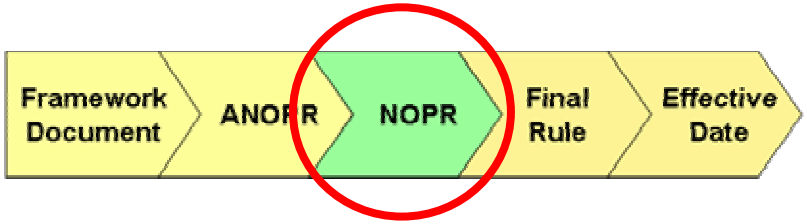
Trial Standard Level Criteria

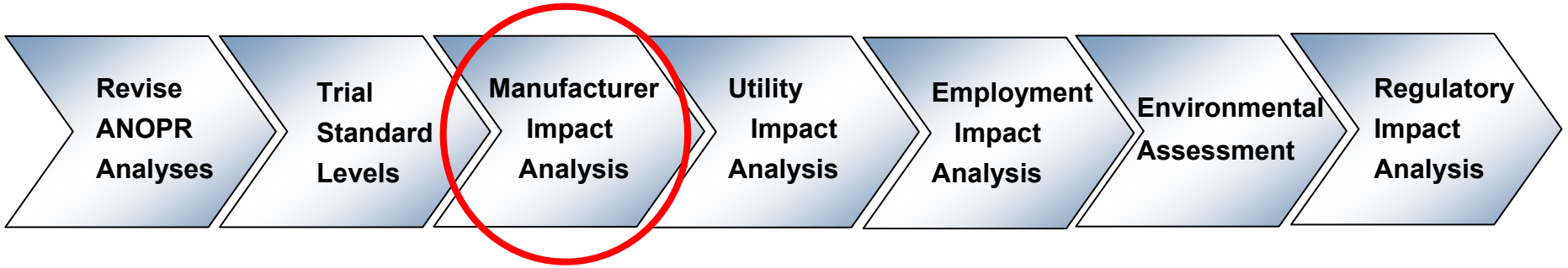
A critical part of the NOPR analysis on which the Department is seeking early guidance and input.

- **Trial standard levels are created from combinations of candidate standard levels at a product class level.**
- **Based around a consistent theme, such as lowest life-cycle cost or payback in 3-years or less.**

The Department seeks comments on the criteria for selecting Trial Standard Levels.

NOPR Analyses Flow Diagram



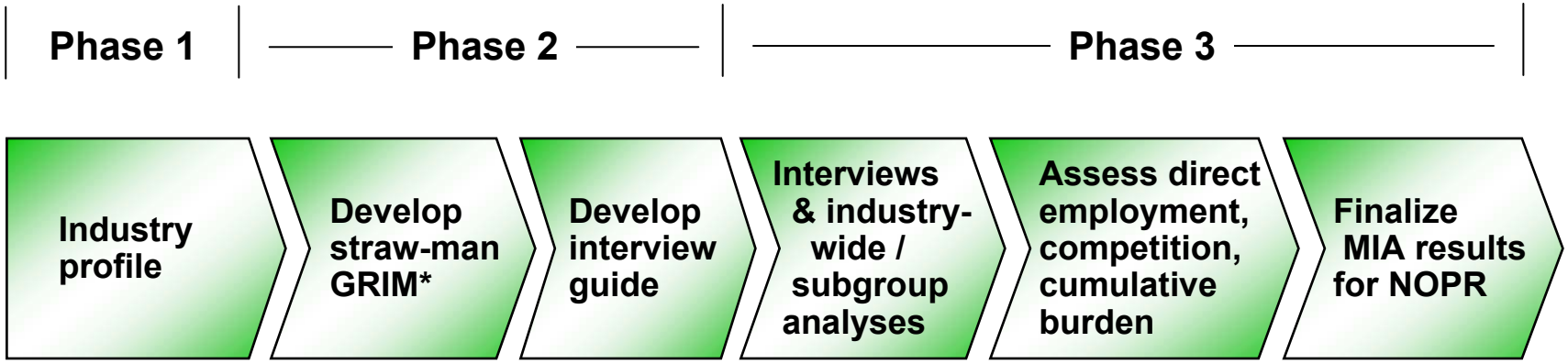


Manufacturer Impact Analysis

- **Purpose**
  - To assess the impacts of standards on commercial air-conditioner and heat pump manufacturers
  - To identify and estimate impacts on manufacturer sub-groups that may be more severely impacted than the industry as a whole
  - To examine the impact of cumulative regulatory burdens on the industry
- **Method**
  - Analyze industry cash flow and net present value through use of the Government Regulatory Impact Model (GRIM)
  - Interview manufacturers to refine inputs to the GRIM, develop sub-group analyses, and address qualitative issues
- **Output**
  - Industry Net Present Value impacts
  - Sub-group Net Present Value impacts
  - Other impacts

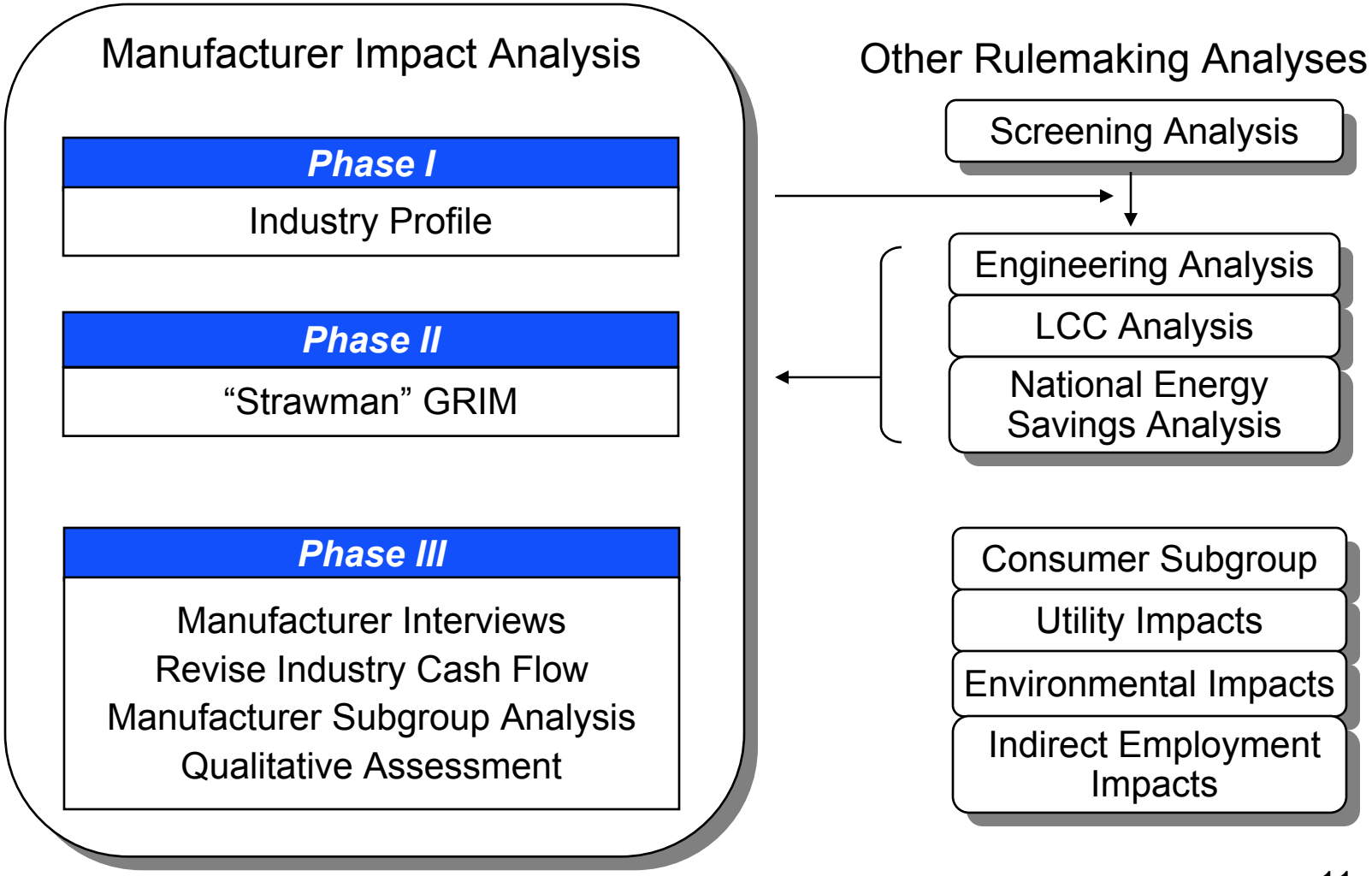
Manufacturer Impact Analysis Process

- The MIA consists of three phases



** Government Regulatory Impact Model (GRIM)*

The MIA is both concurrent and coordinated with activities throughout the rulemaking process.

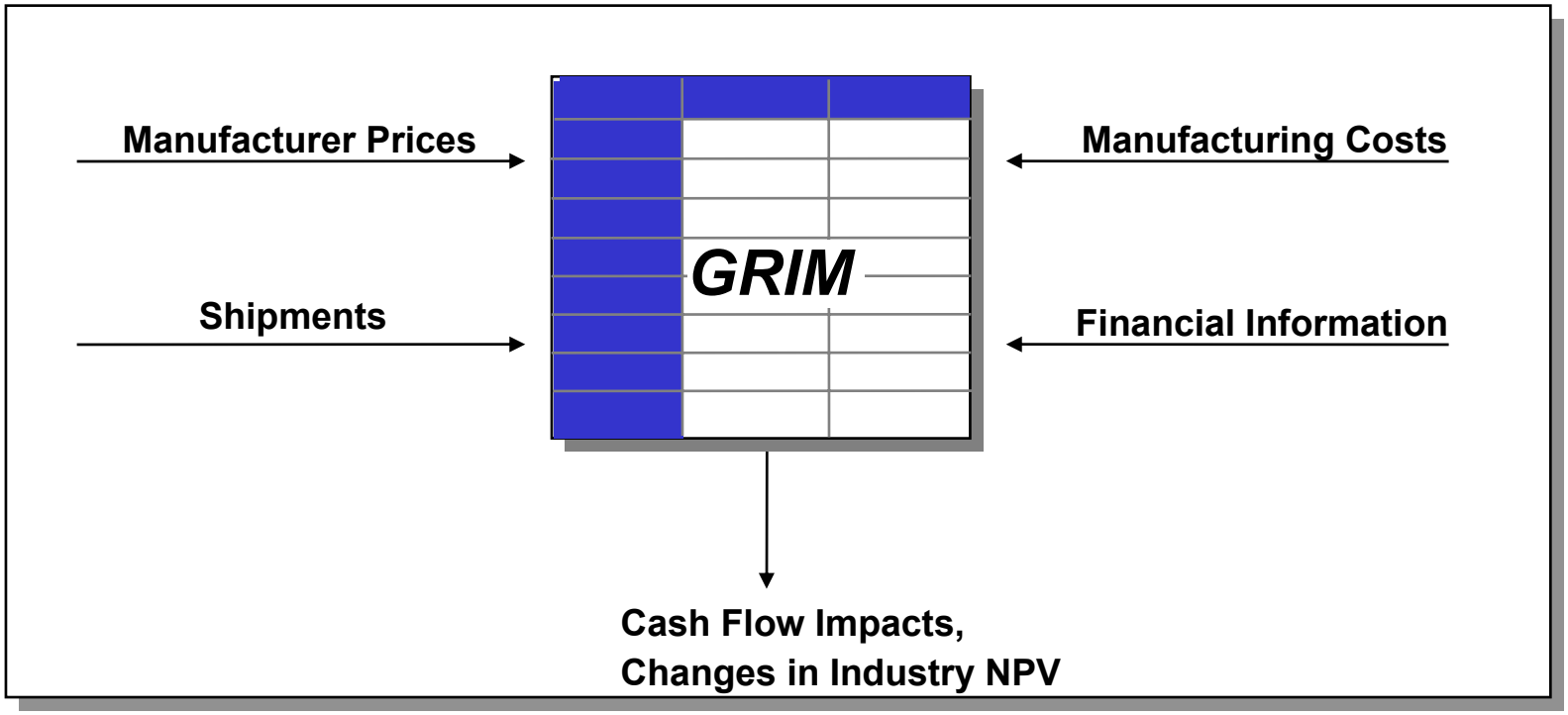


Phase I: Industry Profile

- **Collect financial and market information**
  - Industry reports
  - Company annual reports and websites
  - Trade journals
  - U.S. Census Bureau
  - SEC 10-K form filings
  - ANOPR information: manufacturer production costs, markups and manufacturer selling prices, shipments

Phase II: Develop Straw-man GRIM

- **The Government Regulatory Impact Model (GRIM) is an industry cash flow analysis to estimate the change in industry value due to the introduction of new efficiency standards.**



Phase II: Develop Interview Guide

- **A critical aspect of the MIA involves interviews with manufacturers. An interview guide is sent to manufacturers in preparation for Phase III.**
- **Interview topics will include . . .**
  - Engineering analysis
  - Shipments model
  - Cost structure and financial parameters
  - Conversion costs (capital expenditures, tooling, R&D, testing)
  - Impact of other regulations / cumulative burden
  - Direct employment impacts
  - Import / Export issues
  - Consolidation / competitive impacts
  - Replacement parts or refurbishments
  - Impact of the standard's effective date
  - Other topics important to manufacturers

Phase III: Manufacturer Interviews

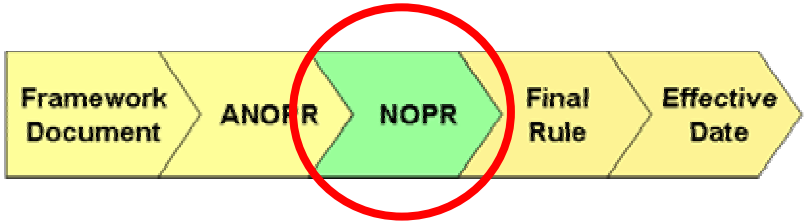
- Expected timeframe
- Time and personnel commitment for manufacturers (industry-wide GRIM, GRIM assumptions, subgroup analysis discussion)
- Confidentiality agreements

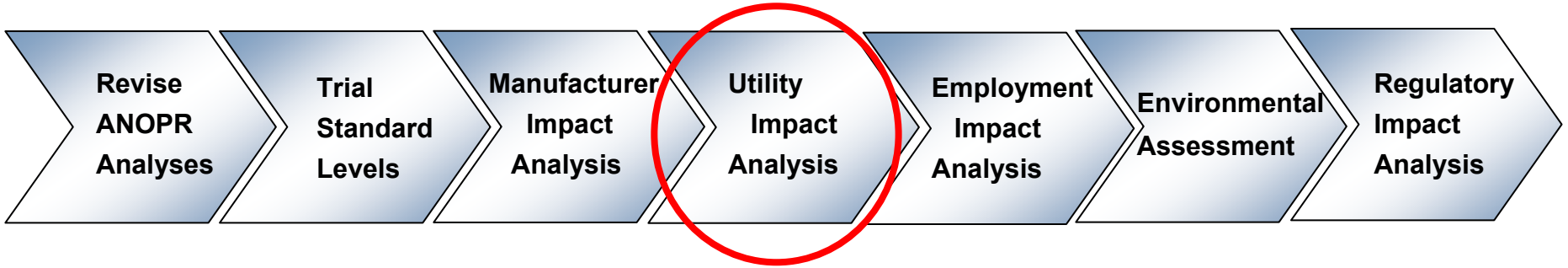
Phase III: Manufacturer Subgroup Analysis

- **The subgroup analysis is a more focused version of the industry-wide analysis.**
  - Work with subgroup representatives to tailor a GRIM incorporating unique financial characteristics
  - Consider and focus on issues of importance to the subgroup, including employment, capacity utilization and cumulative burden
  - Review draft findings with subgroup members during development

The Department invites comment and discussion on manufacturer subgroups to be analyzed.

NOPR Analyses Flow Diagram





Utility Impact Analysis

- **Purpose**
  - To investigate the effects on utilities from reduced energy sales and peak load demand due to potential standards
- **Method**
  - Uses national energy savings results
  - Uses the Energy Information Administration's National Energy Modeling System (NEMS) tailored for DOE's Building Technologies Program (NEMS-BT)
- **Output**
  - Change in electricity sales and price by region
  - Change in the mix of electricity generation
  - Change in new capacity construction

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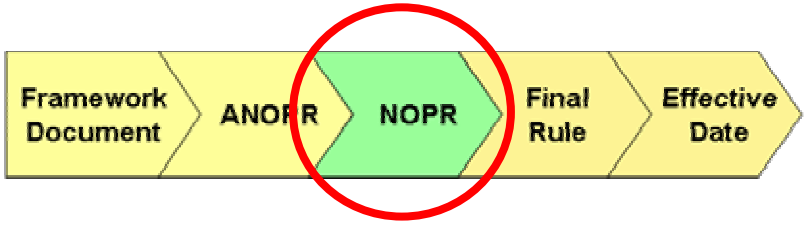
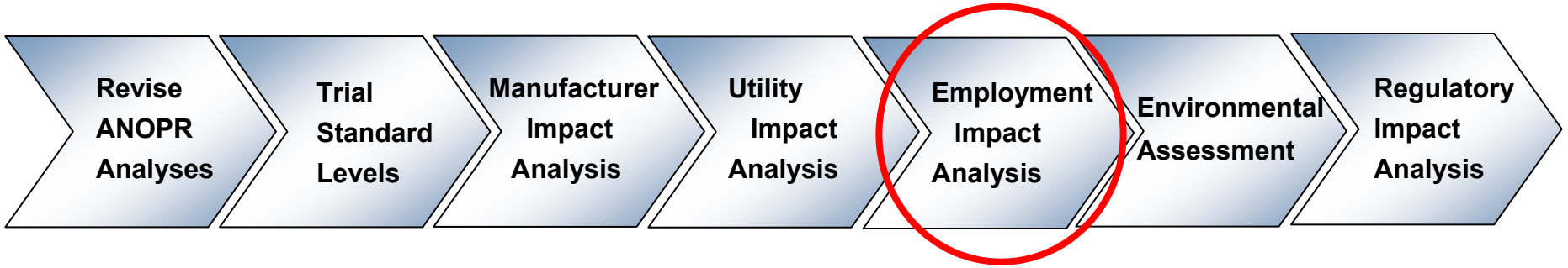
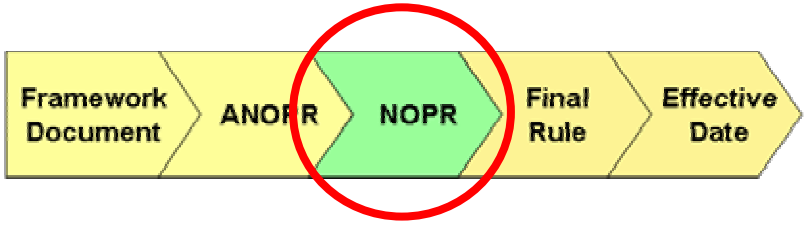


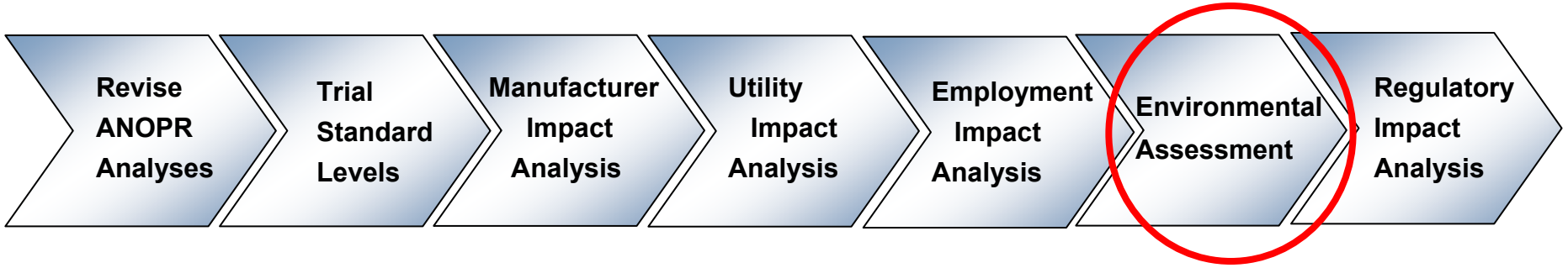


Employment Impact Analysis

- **Purpose**
  - To report net jobs created or eliminated nationally as a consequence of new energy efficiency standards
- **Method**
  - Uses the IMBUILD tool, a buildings-sector version of the IMPLAN national input-output model
  - Changes in equipment and energy expenditures taken from the National Energy Savings Analysis
  - Direct employment impacts taken from the Manufacturer Impact Analysis
- **Output**
  - Change in employment by sector as a consequence of new standards

NOPR Analyses Flow Diagram

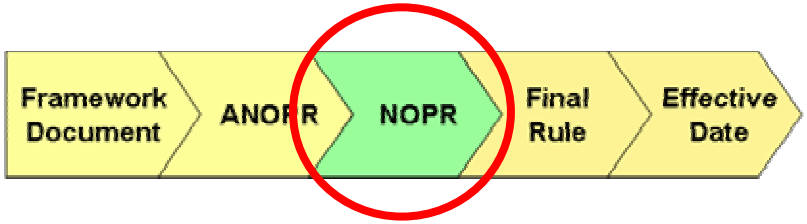


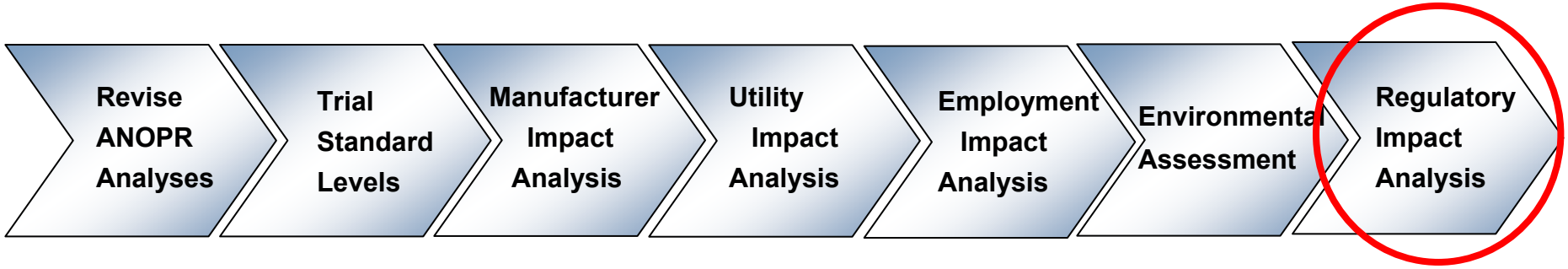


Environmental Assessment

- **Purpose**
  - To report environmental impacts as a consequence of new energy efficiency standards, including changes in power plant emissions
- **Method**
  - Energy savings results taken from the National Energy Savings Analysis
  - Energy Information Administration's National Energy Modeling System (NEMS) provides power-plant emissions
- **Output**
  - Estimate of national emission reductions of NO_x and CO_2

NOPR Analyses Flow Diagram





Regulatory Impact Analysis

- **Purpose**
  - To investigate the national impacts due to non-regulatory alternatives compared with mandatory energy efficiency standards
  - The non-regulatory alternatives that may be considered:
    - No new regulatory action; early replacement; prescriptive standards; customer tax credits; manufacturer tax credits; customer rebates; voluntary efficiency targets; bulk government procurement
- **Method**
  - Modify NES spreadsheet model to consider scenarios. Changes may include: energy prices and escalation factors; implicit market discount rates; customer purchase price, operating cost, and income elasticities; and equipment stock data
- **Output**
  - National Energy Savings and Net Present Value of the non-regulatory alternatives
  - Impact of non-regulatory alternatives on purchase price and use of energy-efficient equipment

The Energy Policy and Conservation Act (EPCA) directs DOE to consider seven factors when setting energy conservation standards

Factor	Analysis
1. Economic impact on consumers and manufacturers	Life-cycle cost analysis Manufacturer impacts analysis
2. Lifetime operating cost savings	Life-cycle cost analysis
3. Total projected energy savings	National impact analysis
4. Impact on utility or performance	Screening analysis Engineering analysis
5. Impact of any lessening of competition	Manufacturer impacts analysis
6. Need for national energy conservation	National impact analysis
7. Other factors the Secretary considers relevant	Environmental assessment Utility impact analysis Employment impact analysis

How to Submit Comments…

- Public Meeting – oral comments will be captured in the transcript and become part of the public record.

- Written comments – ANOPR comment period open until Nov. 12, 2004
  Reference docket #: EE-RM/STD-01-375 and/or RIN #: 1904-AB09

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