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Energy Efficiency and Renewable Energy


**Energy Conservation Standards for
General Service Fluorescent Lamps and
Incandescent Reflector Lamps**

ANOPR Public Meeting

NOPR Analyses and Next Steps

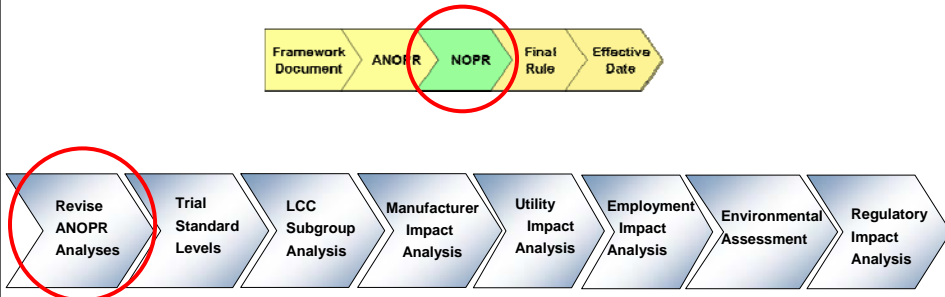
**Building Technologies Program
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy**

March 10-11, 2008

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NOPR Analyses and Next Steps

NOPR Analyses Flow Diagram



Framework Document → ANOPR → NOPR → Final Rule → Effective Date

Revise ANOPR Analyses → Trial Standard Levels → LCC Subgroup Analysis → Manufacturer Impact Analysis → Utility Impact Analysis → Employment Impact Analysis → Environmental Assessment → Regulatory Impact Analysis

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ANOPR Revisions

Revise ANOPR Analyses

ANOPR Analysis	Action
Engineering Analysis	<ul style="list-style-type: none"> Consider ANOPR comments Revise using latest data
Life-Cycle Cost and Payback Period Analyses	<ul style="list-style-type: none"> Consider ANOPR comments Revise using latest data Conduct LCC Sub-Group Analysis
National Impact Analysis	<ul style="list-style-type: none"> Consider ANOPR comments Revise using latest data


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NOPR Analyses and Next Steps

NOPR Analyses Flow Diagram

The flow diagram consists of two main horizontal sequences of chevron-shaped boxes pointing to the right. The top sequence is a high-level process: Framework Document → ANOPR → NOPR → Final Rule → Effective Date. The 'ANOPR' and 'NOPR' boxes are highlighted in yellow, and the 'NOPR' box is circled in red. The bottom sequence is a detailed breakdown of the 'NOPR' step: Revise ANOPR Analyses → Trial Standard Levels → LCC Subgroup Analysis → Manufacturer Impact Analysis → Utility Impact Analysis → Employment Impact Analysis → Environmental Assessment → Regulatory Impact Analysis. The 'Revise ANOPR Analyses' and 'Trial Standard Levels' boxes are highlighted in blue, and the 'Trial Standard Levels' box is circled in red.

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Trial Standard Levels

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 candidate standard 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 and candidate standards identified in the ANOPR
 - Candidate standard levels cover a range of efficiencies and can include:
 - Most energy efficient level (max tech)
 - Efficiency level with the lowest life-cycle cost
 - 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

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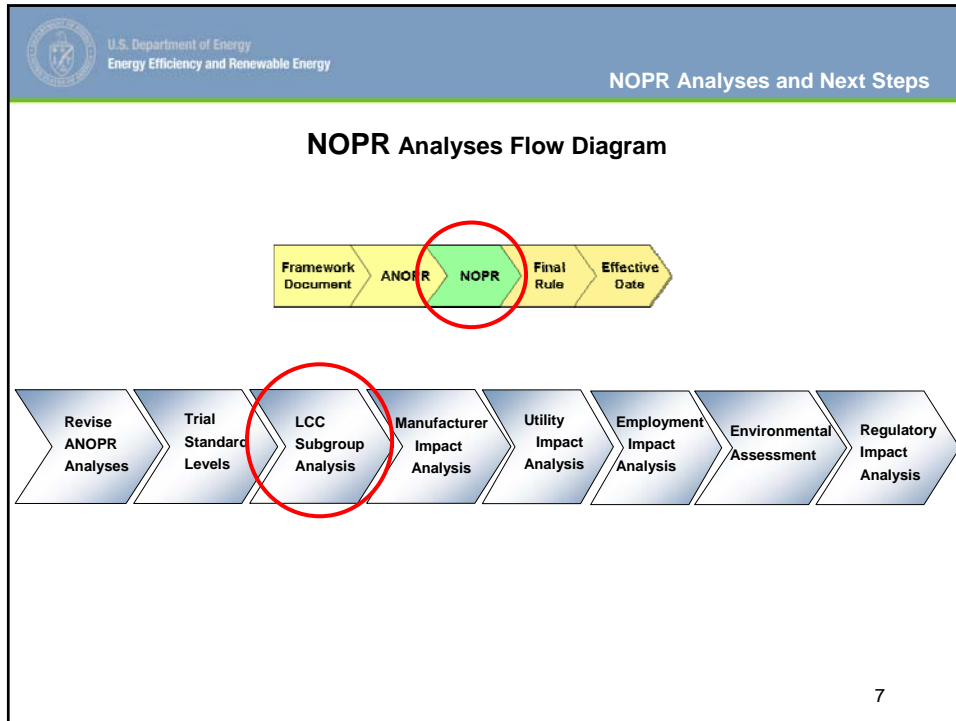
Trial Standard Levels

Trial Standard Levels

- **A critical part of the NOPR analysis on which DOE 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.**

DOE requests feedback on the criteria it should use for basing the selection of Trial Standard Levels. (Issue #13)

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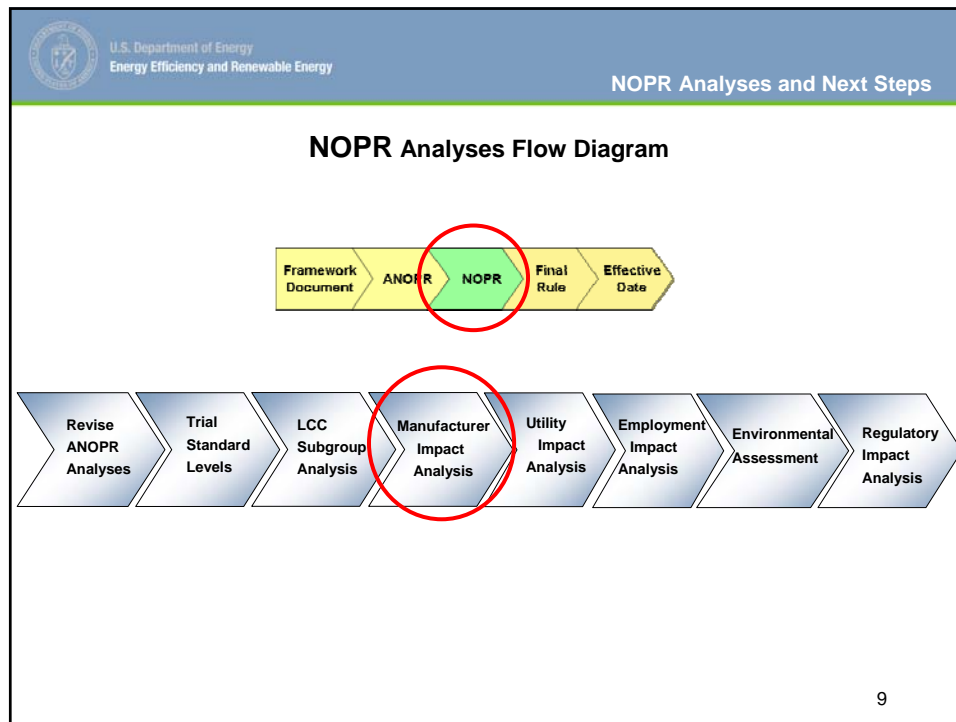
Life-Cycle Cost Subgroup Analysis

LCC Subgroup Analysis

- **Purpose**
 - To evaluate the economic impacts of standards on consumer subgroups who may be disproportionately impacted compared with the general user population
- **Potential subgroups**
 - The LCC Analysis includes the ability to examine impacts of consumers:
 - Operating lamps in a variety of sectors (e.g., residential, commercial, industrial)
 - Operating lamps in a variety of building types (e.g., mobile home, vs. educational facility)
 - Replacing different baseline lamps or lamp-and-ballast systems (e.g., T8 vs. T12 baseline system)
 - Subject to a variety of purchasing events (e.g., lamp failure, ballast failure)
 - DOE may also consider analyzing the impacts of low-income consumers.

DOE welcomes comment on how LCC inputs may change for each consumer subgroup.

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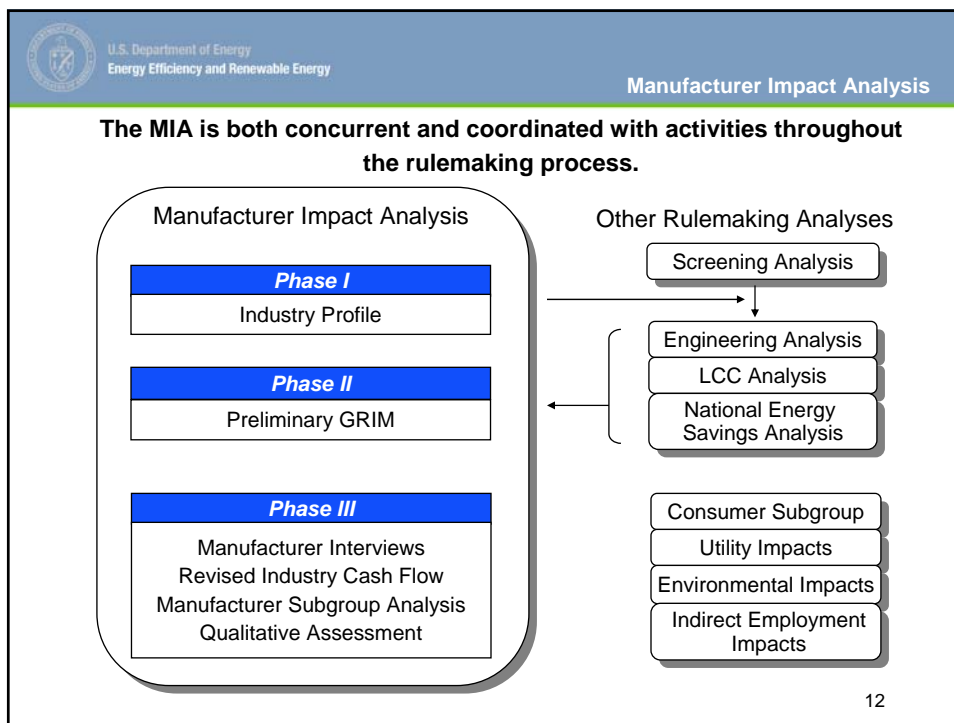
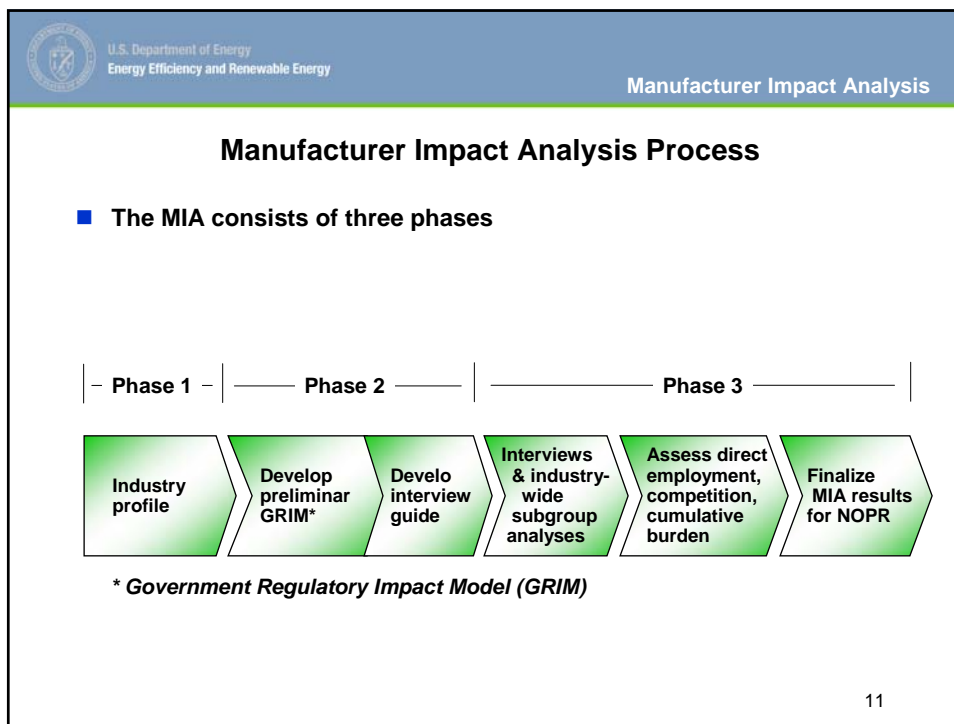
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Manufacturer Impact Analysis

Manufacturer Impact Analysis

- **Purpose**
 - To assess the financial impacts and other quantitative and qualitative industry impacts of standards on manufacturers of general service florescent lamps (GSFL) and incandescent reflector lamps (IRL)
 - 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

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Manufacturer Impact Analysis

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 from the market and technology assessment, engineering analysis, life-cycle cost analysis, and analysis of consumer prices

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Manufacturer Impact Analysis

Phase II: Develop Preliminary GRIM

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

The diagram illustrates the GRIM model as a central grid with the text 'GRIM' in the middle. On the left side, two arrows point towards the grid: 'Manufacturer Prices' (top) and 'Shipments' (bottom). On the right side, two arrows point away from the grid: 'Manufacturing Costs' (top) and 'Financial Information' (bottom). Below the grid, a downward-pointing arrow leads to the text 'Cash Flow Impacts, Changes in Industry NPV'.

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Manufacturer Impact Analysis

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

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Manufacturer Impact Analysis

Phase III: Manufacturer Interviews

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

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Manufacturer Impact Analysis

Phase III: Manufacturer Subgroup Analysis

- **The subgroup analysis is a more focused version of the industry-wide analysis.**
 - Gather information about what sub-groups or characteristics are most appropriate.
 - 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

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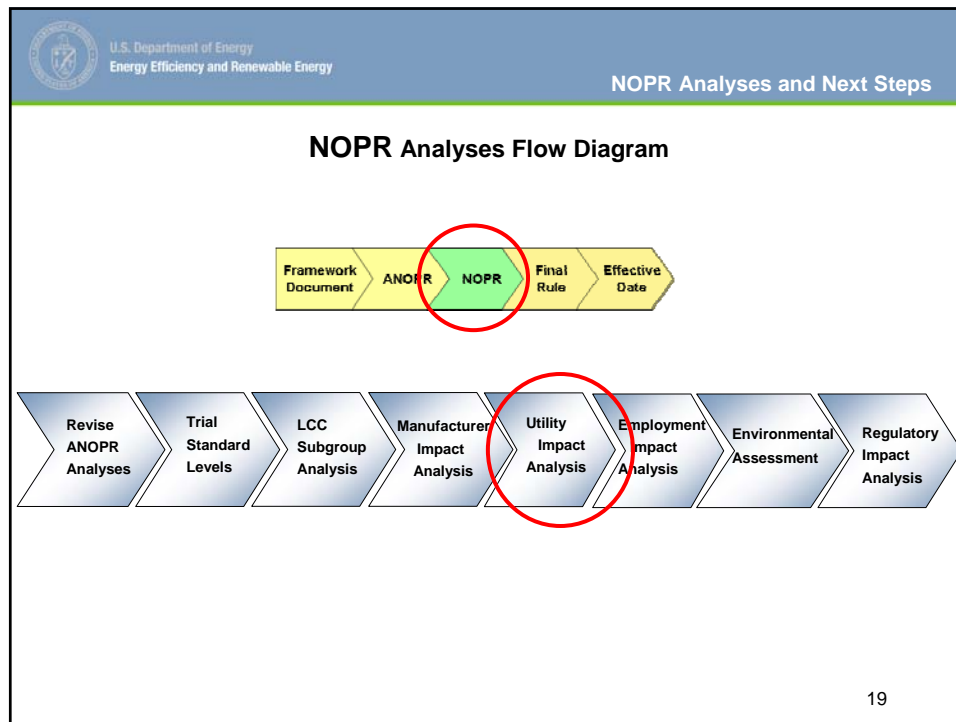
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Manufacturer Impact Analysis

Phase III: Results

- **During interviews, DOE seeks comments and suggestions on the parameters used in the preliminary GRIM. The results for the financial impacts on the industry following these comments are presented in the NOPR phase.**
- **In addition, the results for the following qualitative impacts on the industry are also presented:**
 - Competitive Impact Assessment
 - Manufacturing Capacity Impact
 - Employment Impact
 - Cumulative Regulatory Burden

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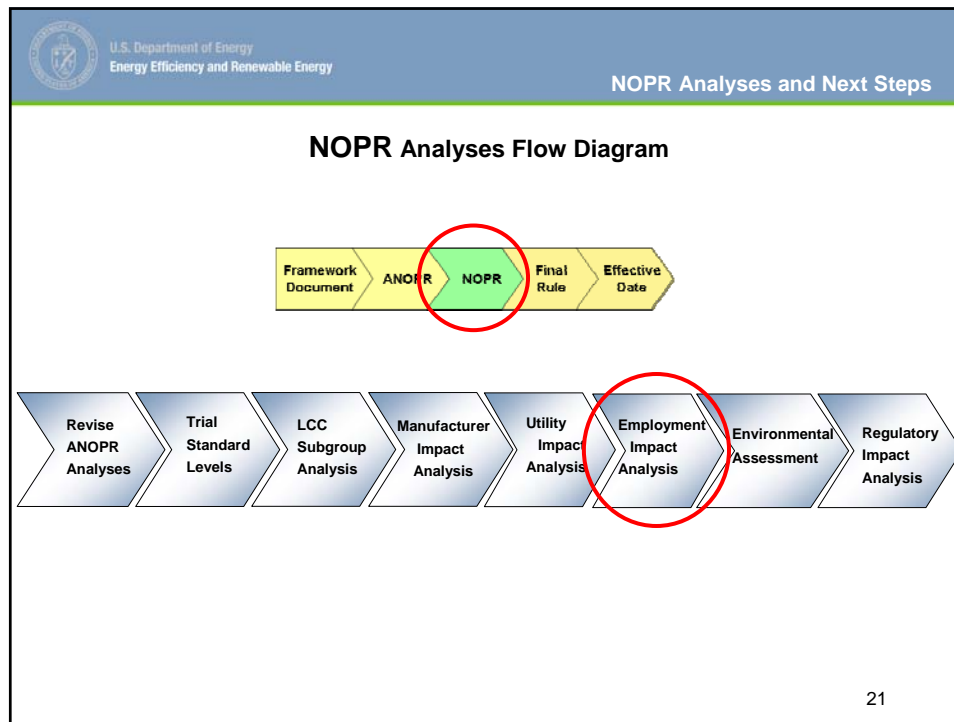
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Utility Impact Analysis

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 energy sales by region
 - Change in the mix of electricity generation
 - Change in new capacity construction

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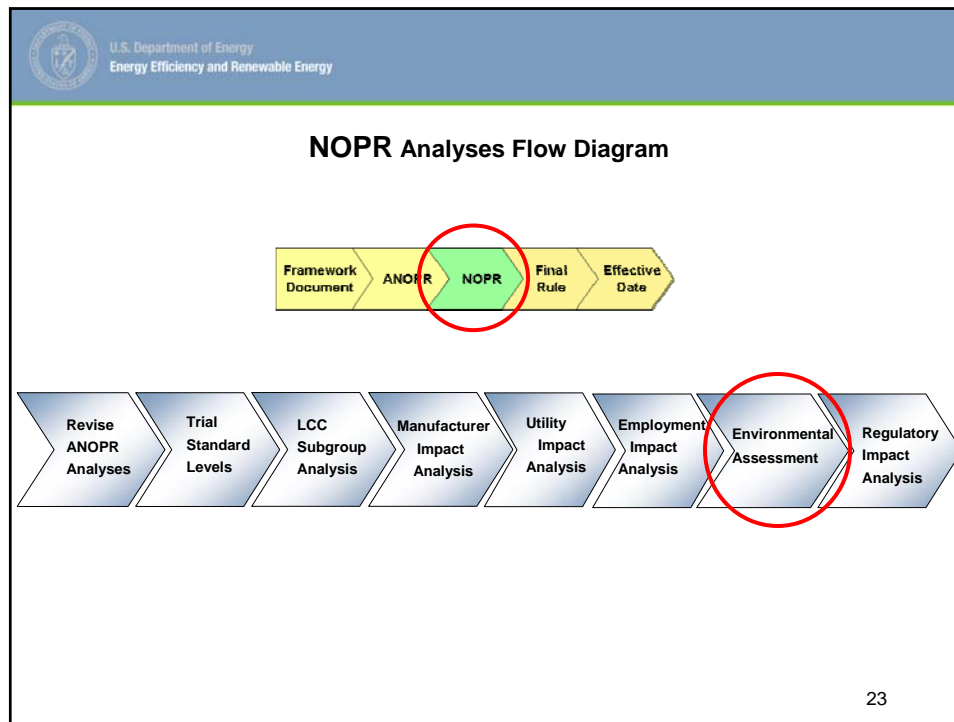
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Employment Impact Analysis

Employment Impact Analysis

- **Purpose**
 - To report net jobs created or eliminated nationally as a consequence of new energy efficiency standards
- **Method**
 - Uses the ImSET tool, a spreadsheet model of the U.S. economy that focuses on 188 sectors most relevant to industrial, commercial, and residential building energy use
 - Changes in product and energy expenditures taken from the National Impact Analysis
 - Estimates the national employment and income effects of energy saving appliances
 - Direct employment impacts taken from the Manufacturer Impact Analysis
- **Output**
 - Change in employment by sector as a consequence of new standards

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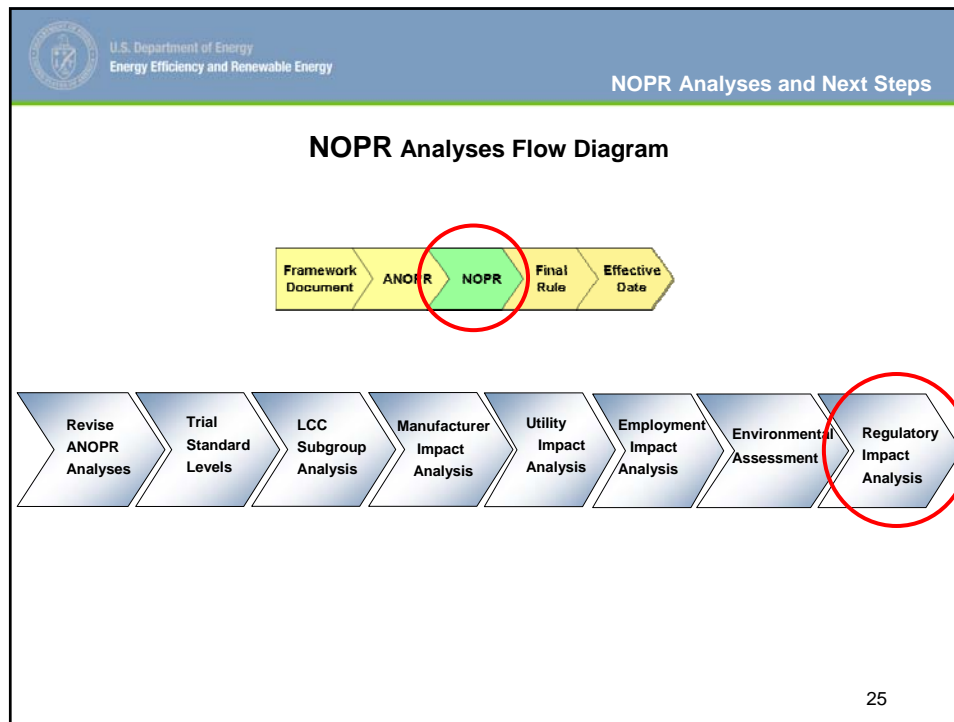


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Environmental Assessment

- **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 Impact Analysis
 - National Energy Modeling System (NEMS-BT) provides power-plant emissions
- **Output**
 - Estimate of national emission reductions
 - Impact on CO₂ emissions reported
 - Power plant SO₂ and NO_x emissions are effectively capped through Congressional legislation resulting in little to no emission reductions due to standards
 - The mercury cap-and-trade rule was recently overturned by the courts; replacement regulations are not yet determined

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Regulatory Impact Analysis

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:
 - Early replacement; customer tax credits; manufacturer tax credits; customer rebates; voluntary efficiency targets; enhanced consumer education and labeling program; and bulk government procurement
- **Method**
 - Modify NES spreadsheet model to consider non-regulatory scenarios
 - Non-regulatory scenarios increase overall lamp efficacy and are modeled by modifying the base-case efficacy trend
 - A percent market adoption estimate is applied to each non-regulatory scenario. In each case, the percent adoption will be less than the 100% adoption implicit in the regulatory standard option.
 - NPV calculated for non-regulatory alternatives in the same way as for the adopted standard
- **Output**
 - National Energy Savings and Net Present Value of the non-regulatory alternatives

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