NEMA Economic Impact Methodology

Introduction

This memorandum outlines the methodology employed by the National Electrical Manufacturers Association (NEMA) to measure the economic impacts of electrical equipment and medical imaging manufacturers on the U.S. economy, state economies, and Congressional district economies.

Economic Impact Analysis

- NEMA defined a range of North American Industry Classification System (NAICS) codes that reasonably delineate the U.S. electroindustry. NAICS is the standard used by federal statistical agencies to classify business establishments for data collection purposes. The identified sectors include:

Figure 1: NAICS Range Included in Economic Impact Analysis

IMPLAN Sector	NAICS Code
Pharmaceutical preparation manufacturing	325412
Other aluminum rolling, drawing, and extruding	331318
Copper rolling, drawing, extruding and alloying	331420
Other fabricated wire product manufacturing	332618
Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing	333415
Turbine and turbine generator set units manufacturing	333611
Speed changer, industrial high-speed drive, and gear manufacturing	333612
Welding and soldering equipment manufacturing	333992
Telephone apparatus manufacturing	334210
Other communications equipment manufacturing	334290
Capacitor, resistor, coil, transformer, and other inductor manufacturing	334416
Electronic connector manufacturing	334417
Other electronic component manufacturing	334419
Electromedical and electrotherapeutic apparatus manufacturing	334510

IMPLAN Sector	NAICS Code
Automatic environmental control manufacturing	334512
Electricity and signal testing instruments manufacturing	334515
Irradiation apparatus manufacturing	334517
Lighting fixture manufacturing	335131
Lighting fixture manufacturing	335132
Electric lamb bulb and part manufacturing	335139
Power, distribution, and specialty transformer manufacturing	335311
Motor and generator manufacturing	335312
Switchgear and switchboard apparatus manufacturing	335313
Relay and industrial control manufacturing	335314
Battery manufacturing	335910
Fiber optic cable manufacturing	335921
Other communication and energy wire manufacturing	335929
Wiring device manufacturing	335931
Wiring device manufacturing	335932
Carbon and graphite product manufacturing	335991
All other miscellaneous electrical equipment and component manufacturing	335999
Motor vehicle electrical and electronic equipment manufacturing	336320

- NEMA identified sector coverage based on NEMA's official product scope and proprietary data. For sectors entirely or predominantly covered by NEMA, such as lighting fixture manufacturing and switchgear and switchboard apparatus manufacturing, the percentage coverage was set to 100% in the analysis. For sectors where NEMA represents only a fraction of the total sector, such as pharmaceutical preparation manufacturing, a coverage percentage was determined. For instance, within the pharmaceutical preparation manufacturing sector, NEMA only represents radioactive diagnostic substances manufacturing, which constitutes around 0.1% of the total sector. Thus, pharmaceutical preparation manufacturing was attributed a 0.1% sector coverage.

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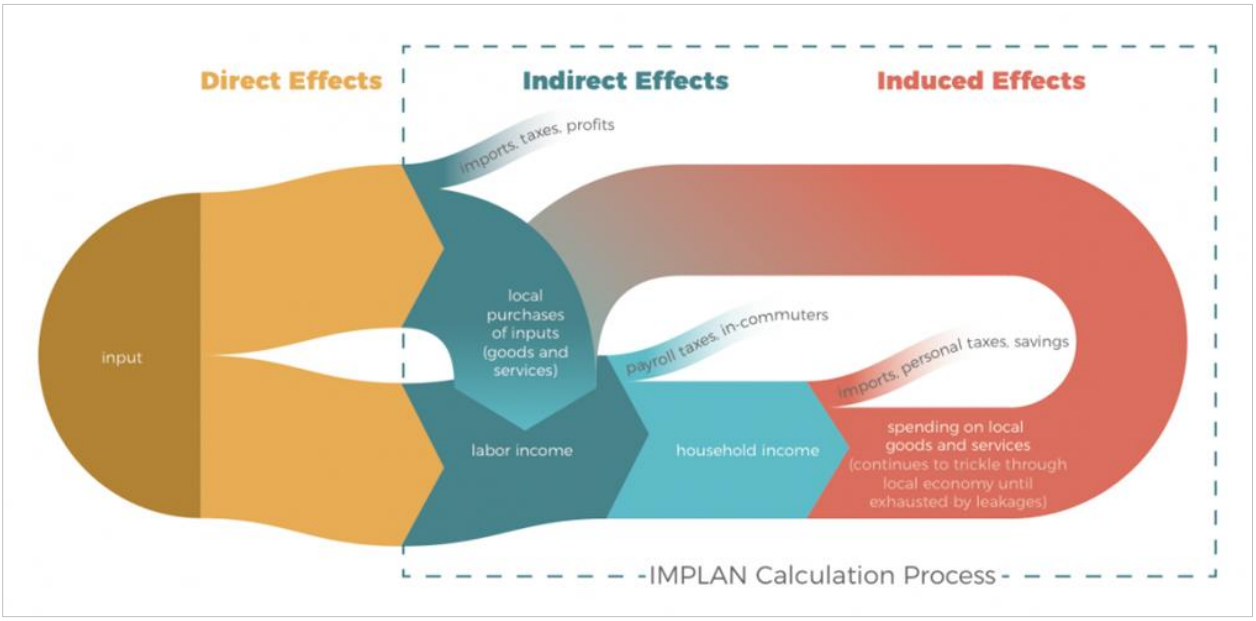
- NEMA then used IMPLAN's Industry Contribution Analysis (ICA)—a method for estimating the value of an industry or group of industries in a region at their current level of production—to assess the current economic impact of the US electroindustry. IMPLAN is an input-output ("IO") model of regional economies in wide use throughout academia, consulting, and government. Figure 2 below shows the calculation process of the IMPLAN Model:

Figure 2: IMPLAN Flowchart



- IMPLAN works by relating different types of economic activity to one another through the industrial supply chain, the labor market, consumer expenditures, tax revenues, and public expenditures. IMPLAN organizes these into three categories described as:
    - ***Direct Effects***: These effects capture the value of the industry's current production levels without considering any expansion or contraction.
    - ***Indirect effects:*** Economic effects stemming from business-to-business purchases in the supply chain.
    - ***Induced effects:*** Economic effects stemming from household spending of labor Income, after the removal of taxes, savings, and commuter income.
- IMPLAN calculates economic contributions for four macroeconomic statistics: output, value added, employment, and labor income. These statistics are defined as:

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  - ***Output:*** The value of industry production, equal to sales plus net inventory change, measured in producer prices.
  - ***Value Added:*** The difference between an industry's total output and the cost of its intermediate inputs; it measures GDP contribution.
  - ***Employment:*** An industry-specific mix of full-time, part-time, and seasonal employment. It is an annual average that accounts for seasonality and follows the same definition used by the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA). IMPLAN employment is not equal to full-time equivalents.
  - ***Labor Income:*** Includes all forms of employment income, such as employee compensation (wages, salaries, and benefits) and proprietor income.

- NEMA simulated the economic contribution of the electroindustry at the congressional district level. NEMA treated the District of Columbia as a *de facto* district/state for the purposes of the economic impacts even though it does not have any House or Senate seats allocated to it. The results from these districts were then aggregated to produce state-level data, which, in turn, was aggregated to determine the national results. The indirect and induced impacts at the congressional district level were scaled with multipliers to ensure that when aggregated, the congressional results matched the industry's impact as measured at the state and national levels.

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