

# Economic Impact of the Industrial Energy Consumers of America's Sustainable Manufacturing & Growth Initiative

*Summary for Policymakers*

Prepared For:  
Industrial Energy Consumers of America

Prepared by:  
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## EXECUTIVE SUMMARY (1/2)

In the past decade, the U.S. manufacturing sector has been challenged by a series of unfavorable trends, including persistently low investment, reduced competitiveness, and the loss of 6 million jobs. Compounded by the severity of the “Great Recession” of 2008-09, these trends have manifested themselves in the form of aging capital equipment, ballooning trade deficits, and the deterioration of local communities that rely on manufacturing as a source of jobs and income.

Nevertheless, the U.S. manufacturing sector remains a critical source of economic growth, jobs, and innovation — contributing \$1.6 trillion to GDP, employing 12 million workers, supplying roughly 58% of the nation’s exports, and directly investing more than \$160 billion in domestic research and development activities each year. The importance of a thriving and globally competitive manufacturing sector is only heightened by the need to revive U.S. exports and rebalance economic growth. At the same time, the challenge of recapitalizing the manufacturing sector creates a unique opportunity to improve energy efficiency and reduce GHG emissions.

With these challenges and opportunities in mind, Industrial Energy Consumers of America (IECA) has developed the *Sustainable Manufacturing & Growth Initiative* — a set of ten policy recommendations designed to jumpstart the U.S. economy in the short-term while creating sustainable economic and environmental benefits in the long-term. Specifically, IECA’s recommendations aim to:

- (1) Jumpstart the U.S. economy by leveraging public funds with private funds to achieve rapid increases in domestic manufacturing investment and maximize “bang for the buck” for U.S. taxpayers.
- (2) Eliminate regulatory barriers to enable investment in energy efficiency and protect manufacturers against the potential costs of future GHG regulation.
- (3) Rebuild the U.S. middle class by creating new, high-paying jobs in the manufacturing sector and the communities that rely on them.
- (4) Revitalize the U.S. manufacturing sector by making energy efficiency investments more affordable — thereby reducing energy costs and enhancing long-run competitiveness.
- (5) Reduce GHG and criteria pollutant emissions by improving energy efficiency and accelerating the development and deployment of advanced technologies.

## EXECUTIVE SUMMARY (2/2)

Commissioned by IECA and conducted by Keybridge Research and the University of Maryland Inforum Modeling Project, this study quantifies the potential impact that the IECA policy package, if adopted, would have on the U.S. economy during the next two decades. Two scenarios, a “Baseline Scenario” and an “IECA Policy Scenario”, were simulated using the University of Maryland’s Long-term Inter-industry Forecasting Tool (LIFT) — a fully articulated, dynamic general equilibrium model of the U.S. economy. To construct the Baseline Scenario, the LIFT model was calibrated to the EIA’s Annual Energy Outlook 2010 “Reference Case” scenario. To construct the IECA Policy Scenario, key elements of the IECA policy proposal were layered on top of the Baseline Scenario in the form of detailed modeling inputs and assumptions. The impact of the IECA policy recommendations are then measured as the difference in key outcomes in the two scenarios.

In short, the modeling results indicate that the IECA policy recommendations are likely to achieve the stated objectives of improving economic growth, creating jobs, enhancing competitiveness, and reducing GHG emissions. Specifically, the study finds that the IECA policy package would:<sup>1</sup>

- Increase real GDP by \$77 billion in 2020.
- Increase cumulative employment by 9.4 million job-years in 2010-2030.<sup>2</sup>
- Increase cumulative private investment by more than \$1 trillion in 2010-2030.
- Increase family income by an average of \$788 (0.68%) in 2020.
- Increase cumulative net exports by \$392 billion in 2010-2030.
- Reduce energy-related GHG emissions by 13% in 2020.

Furthermore, it is estimated that the net fiscal cost associated with the IECA policy recommendations will be less than 0.1% of discretionary government spending between 2011-2030. Indeed, it is estimated that the policies will result in a cumulative increase in real GDP growth that is approximately **20 times greater** than the cumulative net fiscal cost — providing U.S. taxpayers with significant “bang for the buck”.

<sup>1</sup> All results are expressed relative to the Baseline Scenario. Dollar-denominated results are reported in 2010 constant dollars.

<sup>2</sup> A job-year is defined as one job for one year.

# Results Summary

(Difference Relative to Baseline Scenario<sup>1</sup>)

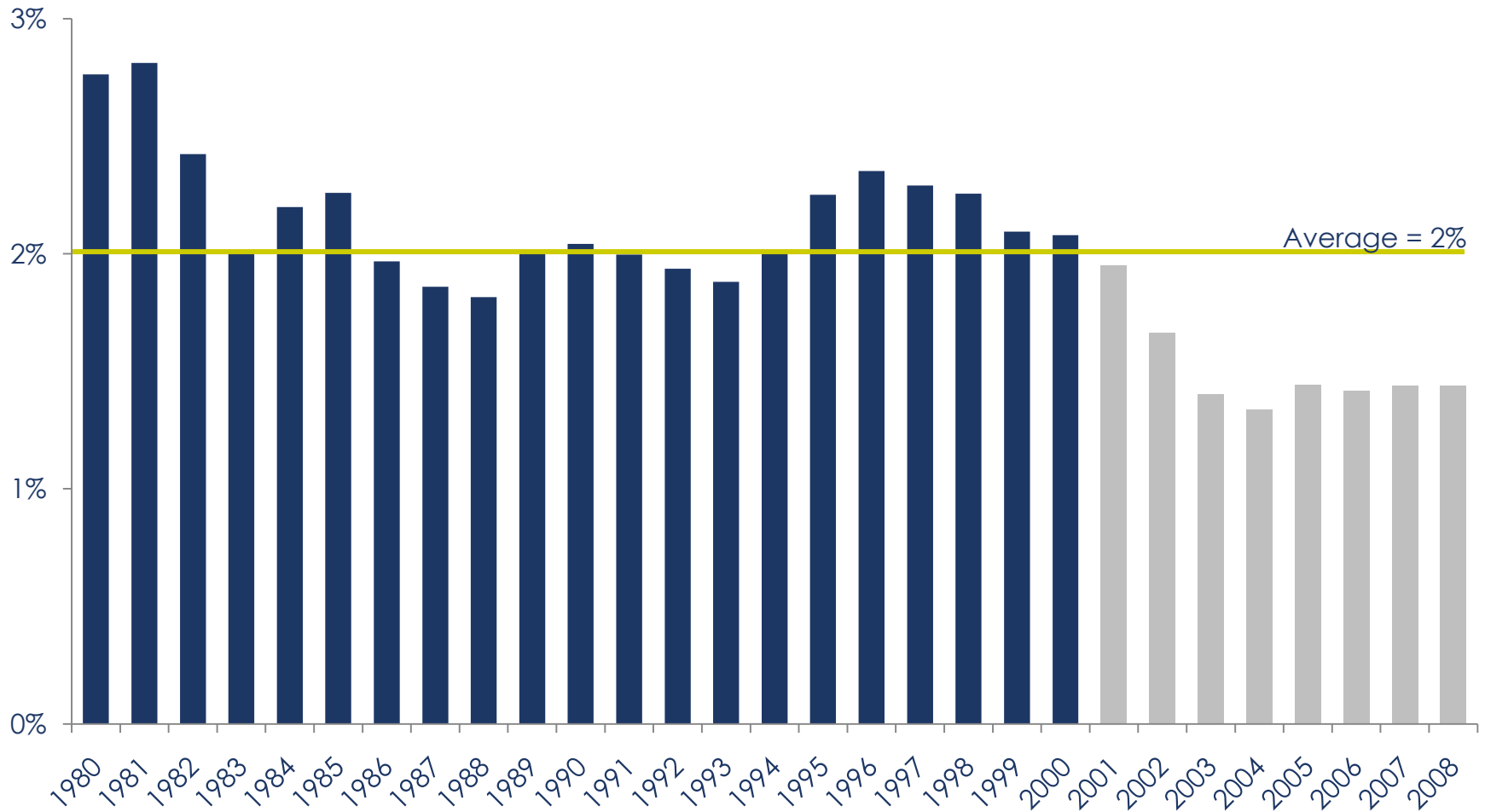
	Annual Impacts in 2020	Cumulative Impacts in 2010-2020	Cumulative Impacts in 2010-2030
Real Gross Domestic Product	\$77 billion	\$389 billion	\$1,227 billion
Employment	567,000 jobs	3.2 million job-years <sup>2</sup>	9.4 million job-years
Average Household Income	\$788	\$4,277	\$12,244
Private Fixed Investment	\$71 billion	\$407 billion	\$1,058 billion
Net Exports	\$13.8 billion	\$14.2 billion	\$392 billion
Energy Intensity	-17%	-10%	-15%
Energy-related GHG Emissions	-13%	-7%	-12%

<sup>1</sup> Dollar-denominated results are reported in 2010 constant dollars.

<sup>2</sup> A job-year is defined as one job for one year.

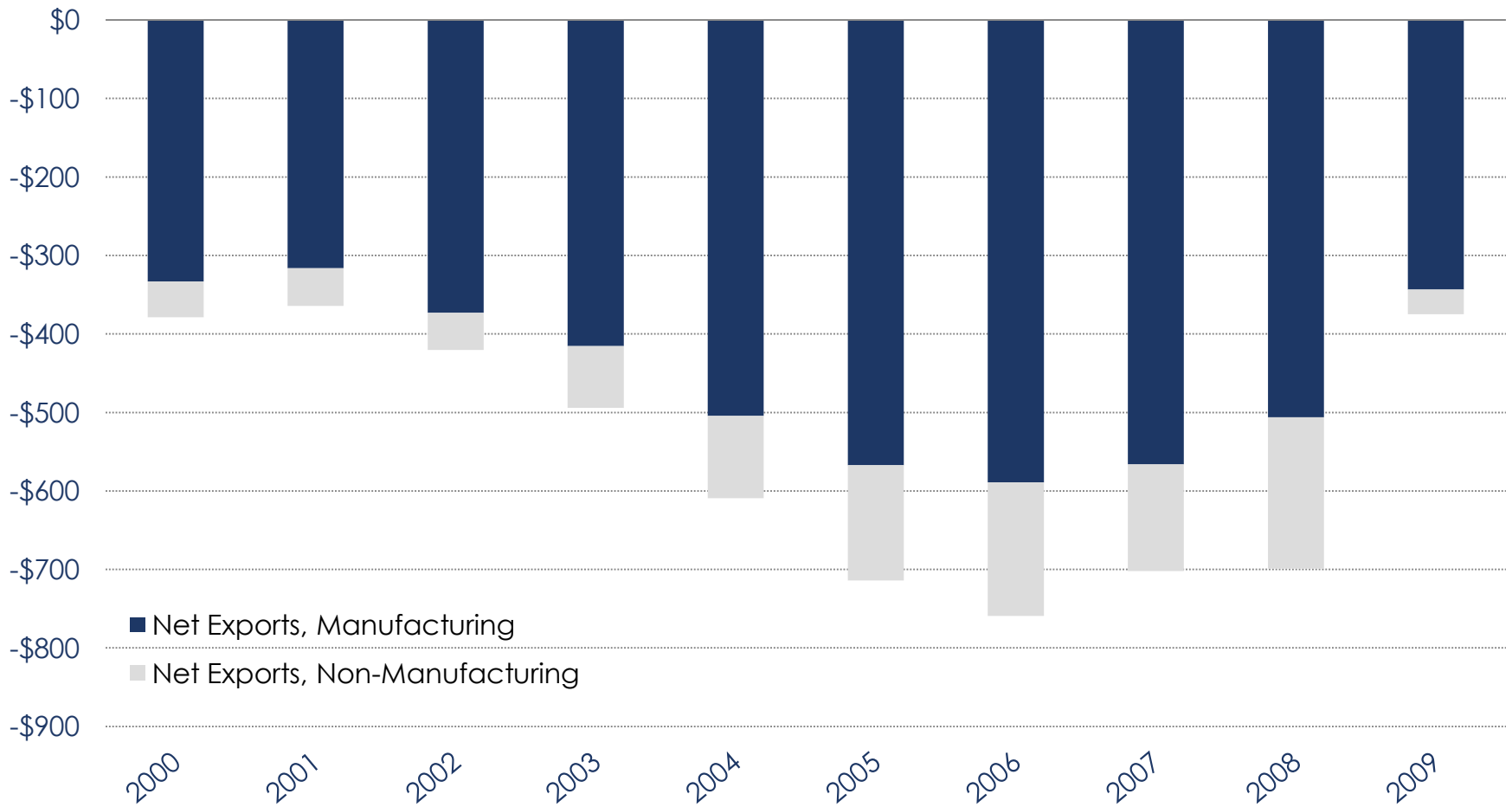
The U.S. manufacturing sector has suffered from almost a decade of persistently low investment.

Manufacturing Investment  
(Percent of GDP)



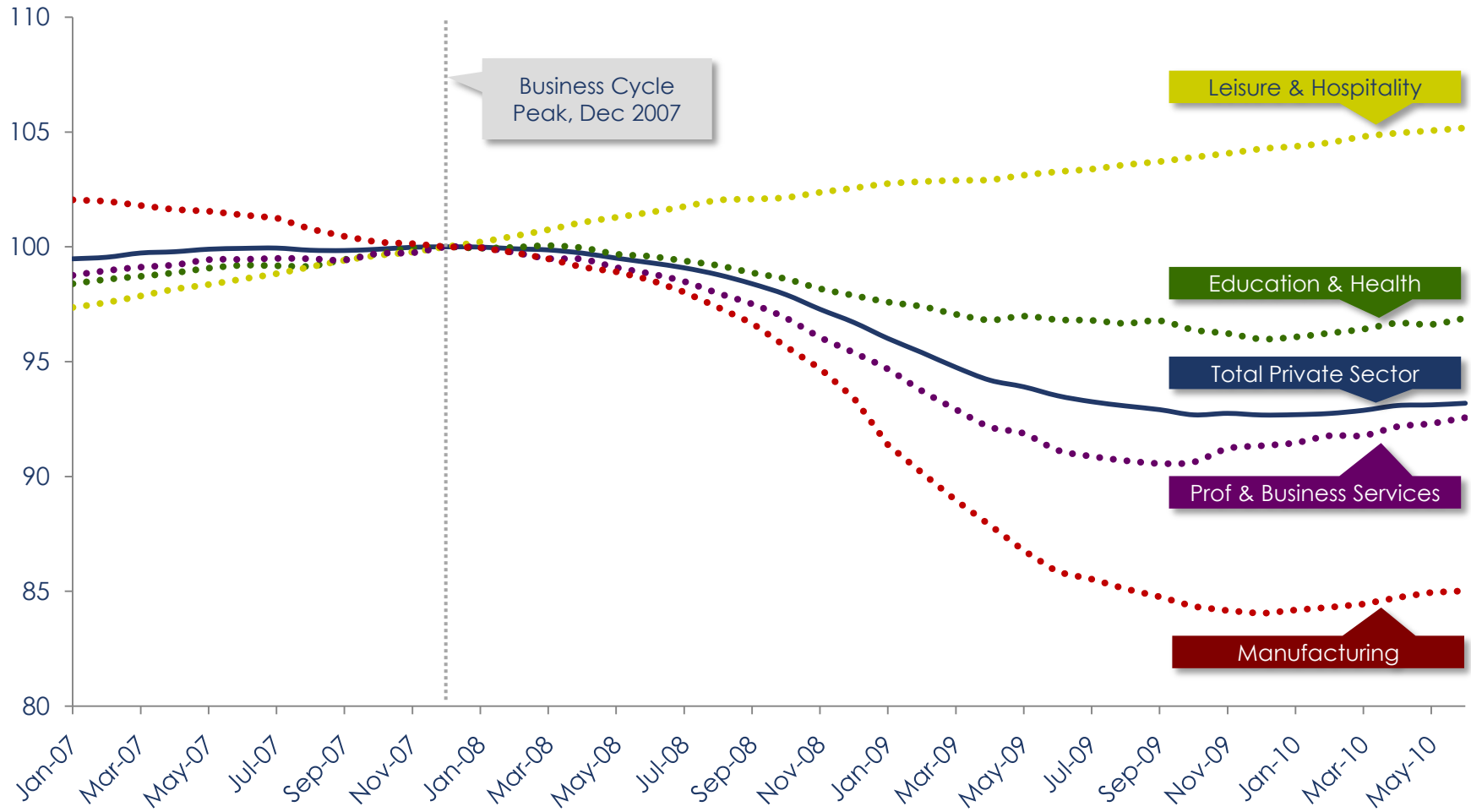
This decline in investment contributed to a loss of manufacturing competitiveness, as is evidenced by a ballooning trade deficit.

U.S. Trade Balance  
(Billion \$)



Compounding already unfavorable trends, the impact of the “Great Recession” on manufacturing was particularly severe.

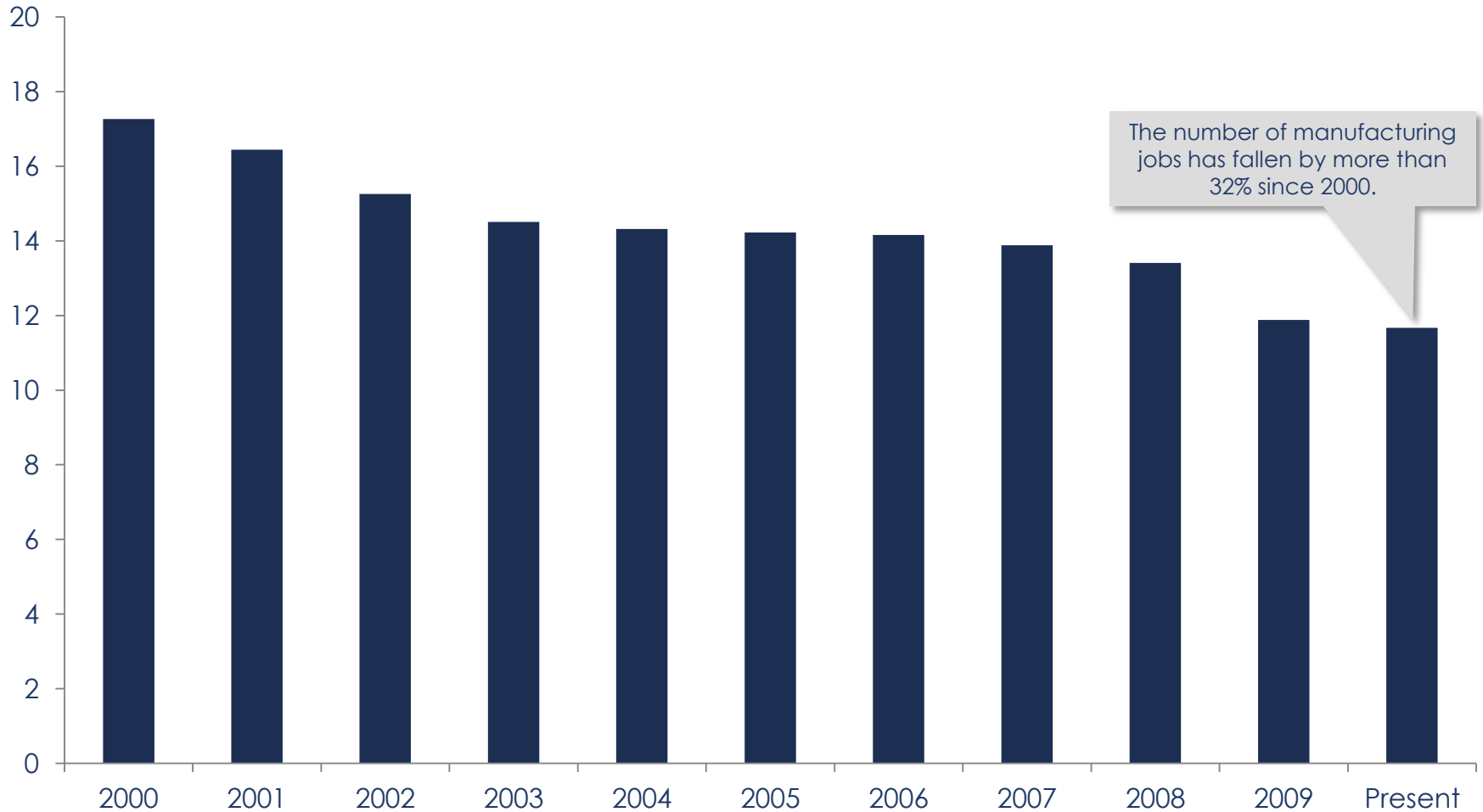
Employment by Economic Sector  
(Index, Dec 2007 = 100)



Source: BEA, NIPA Table 1.1.5; BLS, Current Employment Statistics

In the past decade alone, the U.S. manufacturing sector has lost nearly six million jobs.

U.S. Manufacturing Employment  
(Million Jobs)





Nevertheless, the manufacturing sector remains a critical source of growth, jobs, and innovation in the U.S. economy.

Key Facts & Figures:  
The Manufacturing Sector's Contributions to the U.S. Economy

**\$1.6 Trillion**

*value-added to the U.S. economy by  
the manufacturing sector in 2009.*

**12 Million**

*jobs provided by the U.S.  
manufacturing sector in 2009.*

**58%**

*percentage of U.S. exports supplied by the  
manufacturing sector in 2009.*

**\$160 billion**

*direct domestic R&D spending by U.S.  
manufacturing companies in 2008.*

IECA has developed an initiative that aims to achieve short- and long-term economic goals while delivering environmental benefits.

## IECA Sustainable Manufacturing & Growth Initiative: Objectives

- 1 Jump Start the Economy**

Revitalize the U.S. economy by leveraging public funds with private funds to achieve rapid increases in domestic manufacturing investment and maximize “bang for the buck” for U.S. taxpayers.
- 2 Remove Barriers to Investment**

Eliminate regulatory barriers to investment in energy efficiency and protect manufacturers against the potential costs of future GHG regulation.
- 3 Create Jobs**

Rebuild the U.S. middle class by creating new, high-paying jobs in the manufacturing sector and the communities that rely on them.
- 4 Enhance Competitiveness**

Revitalize the U.S. manufacturing sector by making energy efficiency investments more affordable — thereby reducing energy costs and enhancing long-run competitiveness.
- 5 Reduce Emissions**

Reduce GHG and criteria pollutant emissions by improving energy efficiency and accelerating the development and deployment of advanced technologies.

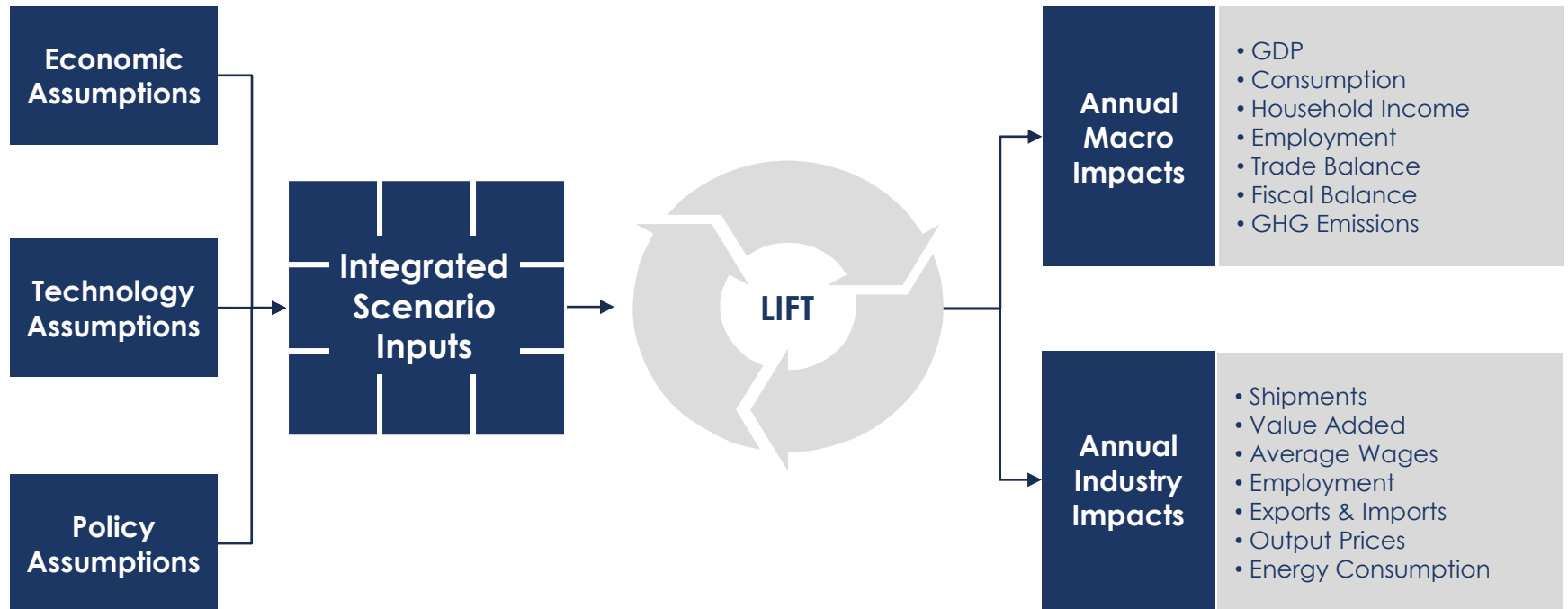
IECA's proposal consists of ten policies designed to catalyze, accelerate, and leverage investments in U.S. manufacturing.

## IECA Sustainable Manufacturing & Growth Initiative: Policy Recommendations

<b>Policy #1</b>	<i>Establish a 30% tax credit for capital investment projects that improve energy efficiency and reduce GHG emissions intensity.</i>
<b>Policy #2</b>	<i>Establish a loan program that provides access to low-cost capital for investment projects that improve energy efficiency and reduce GHG emissions intensity.</i>
<b>Policy #3</b>	<i>Establish a Clean Energy Standard Offer Program (CESOP) for combined heat and power (CHP) projects.</i>
<b>Policy #4</b>	<i>Establish a Clean Energy Standard Offer Program (CESOP) for recycled energy projects.</i>
<b>Policy #5</b>	<i>Narrowly reform New Source Review (NSR) for energy efficiency projects in the manufacturing sector for 10 years.</i>
<b>Policy #6</b>	<i>Preempt the manufacturing sector from EPA and state action to regulate GHG emissions under the Clean Air Act for 10 years.</i>
<b>Policy #7</b>	<i>Provide early action credit for direct and indirect GHG emission reductions, with such credits being bankable and applicable to compliance with future GHG regulations.</i>
<b>Policy #8</b>	<i>Provide 100% expensing of capital expenditures for high-risk, long-term research, development, and deployment (RD&amp;D) projects.</i>
<b>Policy #9</b>	<i>Increase R&amp;D funding under the DOE Industrial Technologies Program to develop break-thru technologies in energy-intensive industries.</i>
<b>Policy #10</b>	<i>Strengthen building standards to improve energy efficiency in new and existing residential homes and commercial buildings.</i>

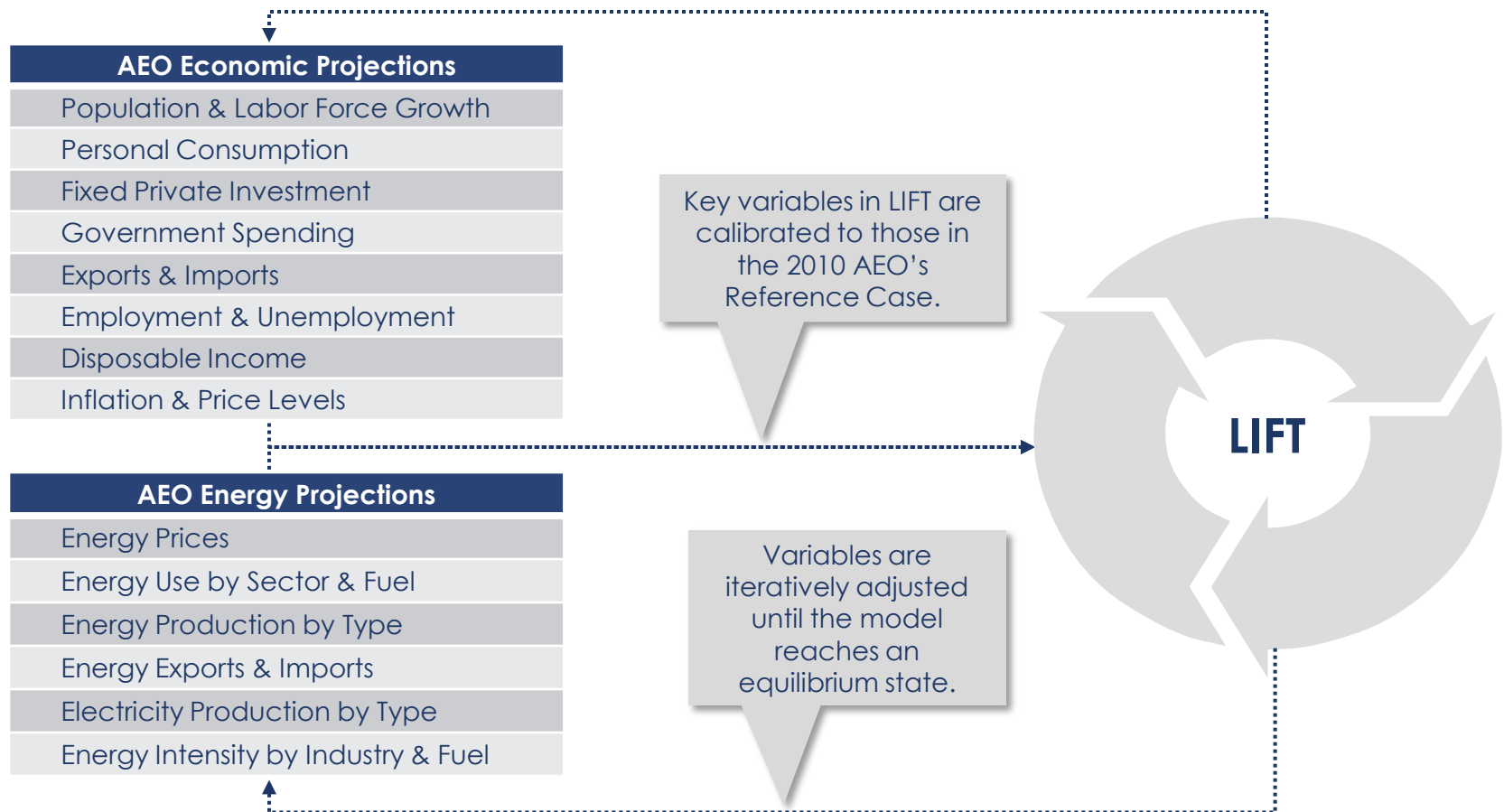
The impact of the IECA proposal was simulated using the University of Maryland's Long-term Inter-industry Forecasting Tool (LIFT).

The University of Maryland Inforum LIFT Model:  
Key Inputs & Outputs



# The Baseline Scenario was constructed by calibrating LIFT to the EIA's 2010 Annual Energy Outlook Reference Case scenario.\*

## Calibrating the LIFT Model to the AEO 2010: Key Variables



\*Calibration to the most recent version of the EIA's Annual Energy Outlook (2010 AEO) is common practice in modeling analyses of federal energy or climate legislation. The adoption of the AEO's forecasts in the Baseline Scenario for this study does not suggest that IECA or the modeling team endorse those forecasts.

# The Policy Scenario was constructed by integrating six elements of the IECA policy proposal into the Baseline Scenario.

## IECA Policy Recommendations Simulated in the LIFT Model\*

### Policy #1: Investment Tax Credit (ITC)

The ITC is modeled as changes in the cost of capital for energy efficient equipment, affecting investment levels & energy efficiency in manufacturing processes.

### Policy #2: Low-Cost Loan Program (LCLP)

Similarly, the LCLP is modeled as changes in the cost of capital for equipment, affecting investment levels & energy efficiency in manufacturing processes.

### Policy #3: CESOP for CHP

The Clean Energy Standard Offer Program (CESOP) for CHP is modeled as changes in CHP deployment and thus electricity and natural gas demand, investment, and employment in certain industries.

### Policy #4: CESOP for Recycled Energy

The CESOP for Recycled Energy is modeled as changes in recycled energy project deployment and thus electricity demand, investment, and employment in certain industries.

### Policy #5: Narrow NSR Reform

New Source Review (NSR) reform is assumed to enable timely deployment of cost-effective energy efficiency technologies that would otherwise be delayed or avoided due to the burden of NSR.

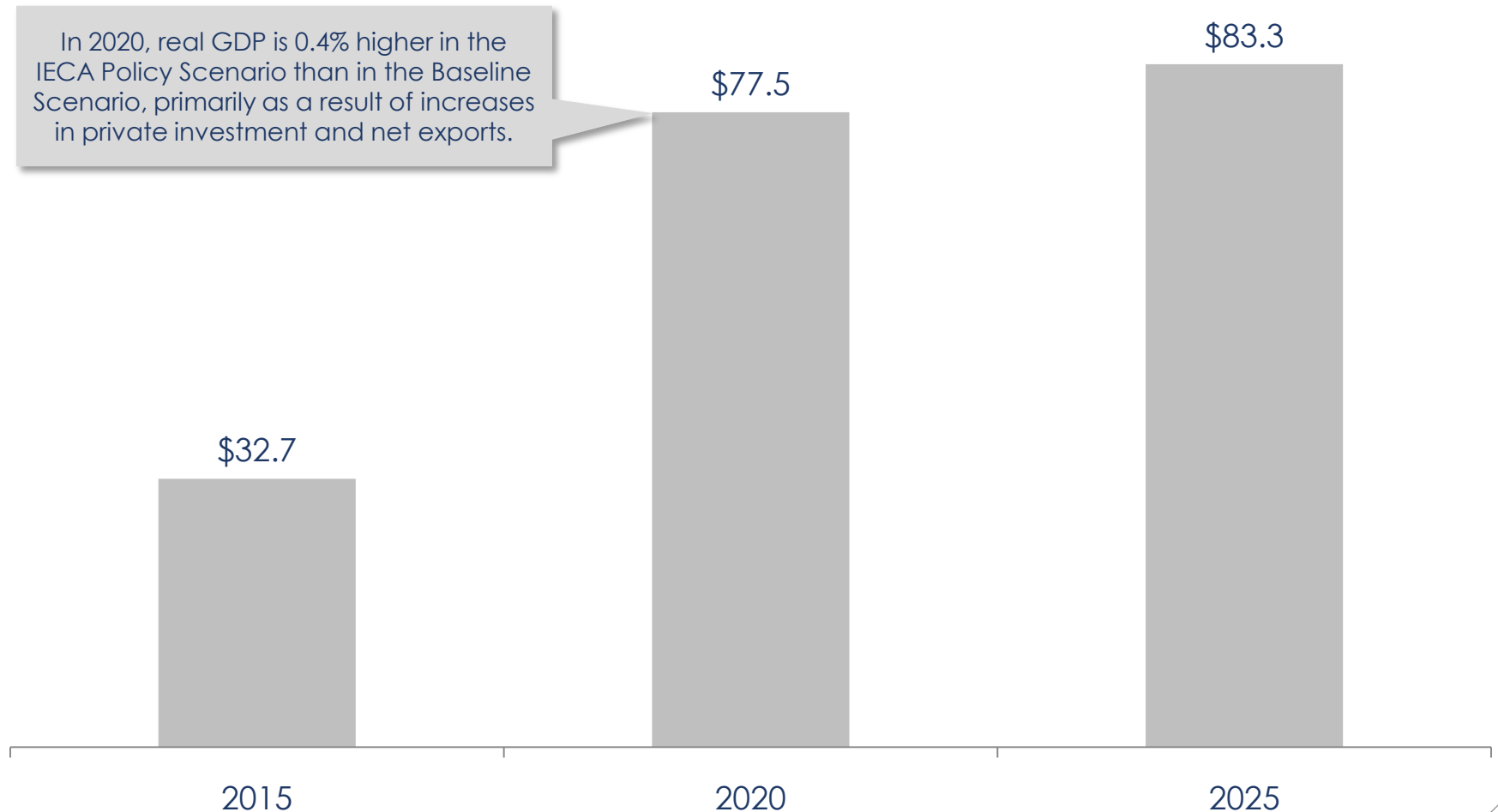
### Policy #10: Building Efficiency Standards

Strengthened building standards & appliance efficiency mandates are modeled as changes in the energy efficiency of residential, commercial, and industrial buildings.

\*Policies #6-9 were not simulated, as they were deemed to be exceedingly difficult to model with sufficient precision.

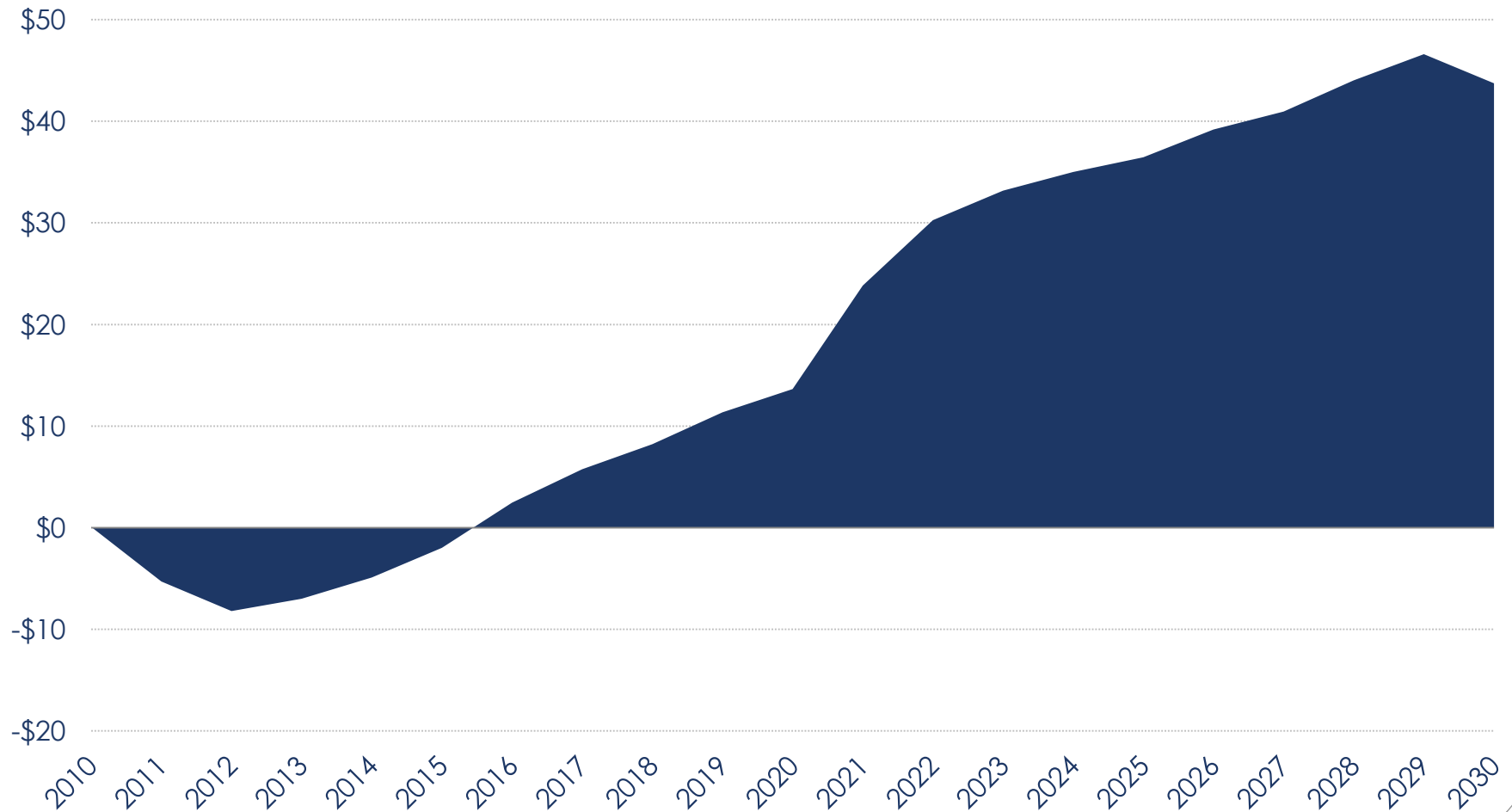
The study finds that under the IECA policies, real annual gross domestic product increases by more than \$77 billion in 2020.

IECA Policy Scenario: U.S. Gross Domestic Product  
(Difference Relative to Baseline Scenario, \$2010 Billion )



Increased investment improves manufacturing competitiveness and boosts cumulative net exports by \$392 billion in 2011-2030.

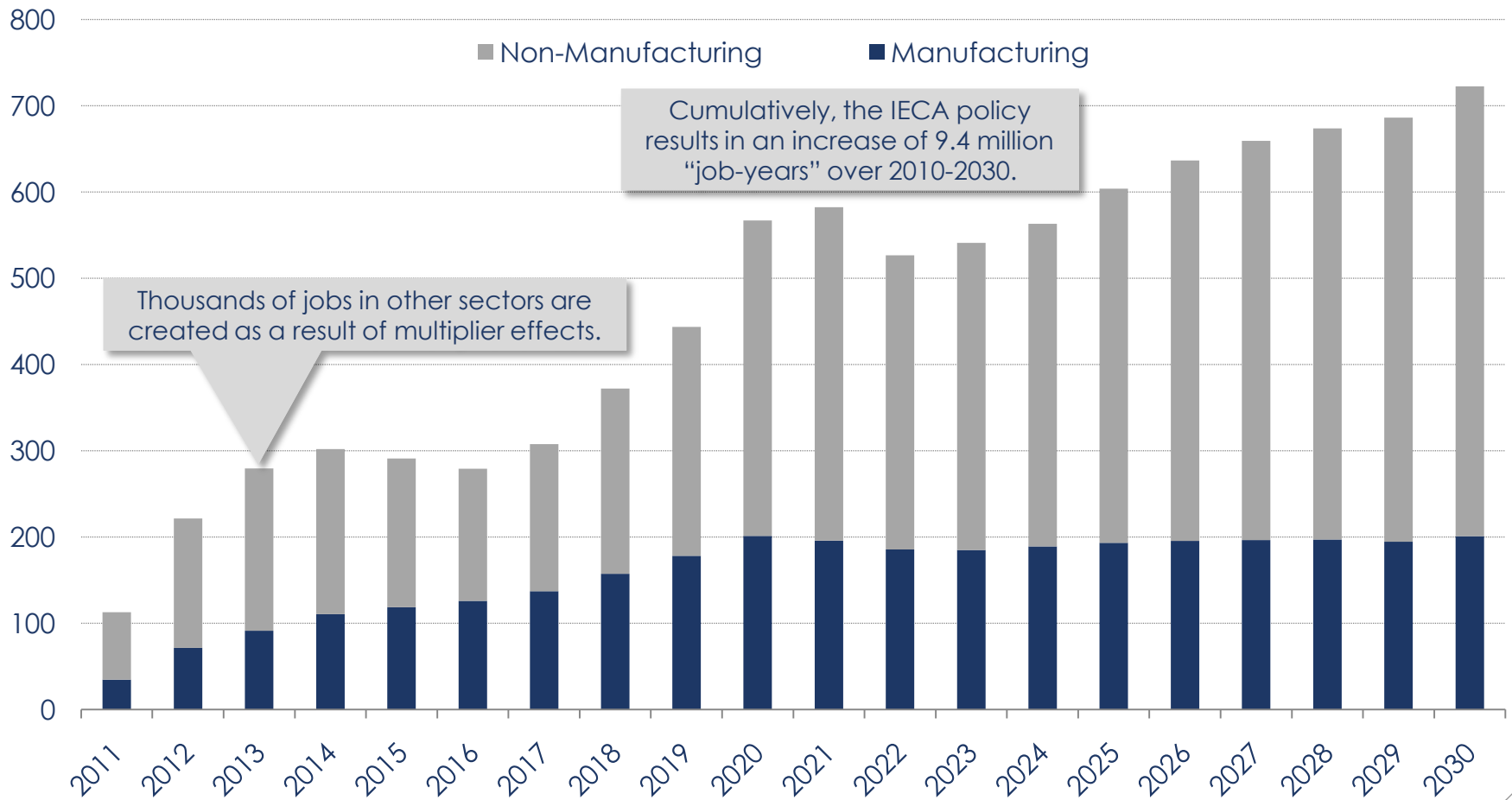
IECA Policy Scenario: U.S. Net Exports  
(Difference Relative to Baseline Scenario, Billion 2010\$)





As a result, approximately 567,000 new jobs are created by 2020, including 200,000 in the manufacturing sector.

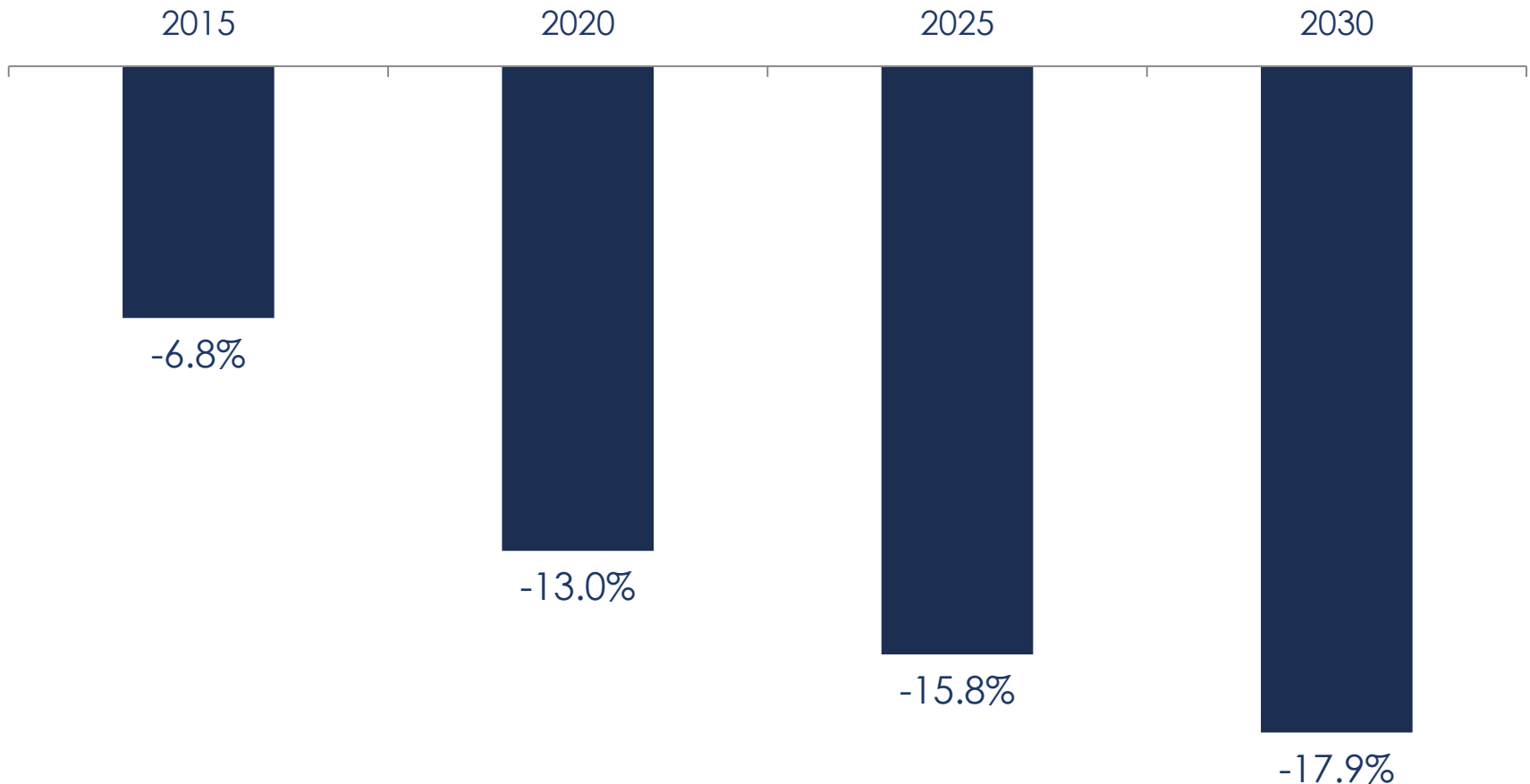
Net U.S. Job Creation  
(Difference Relative to Baseline Scenario, Thousand Jobs per Year)



Source: Keybridge Research and University of Maryland Inforum Modeling Project.

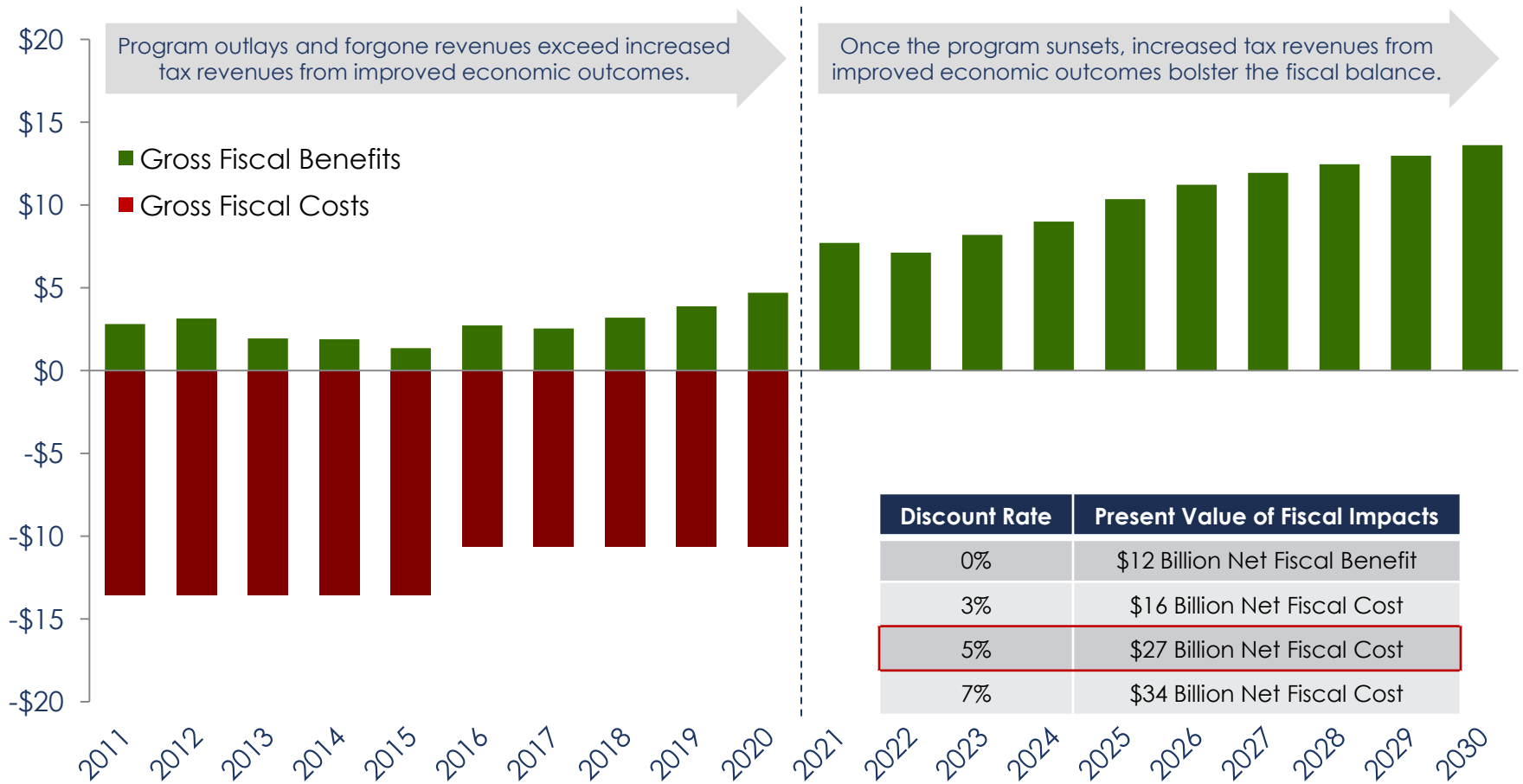
Additionally, energy-related GHG emissions decrease by 13% in 2020 and 18% in 2030.

IECA Policy Scenario: GHG Emissions  
(Difference from Baseline Scenario, Percent)



Furthermore, additional tax revenues in a stronger economy help the IECA policy package largely “pay for itself” by 2030.

IECA Policy Scenario: Federal Fiscal Impact  
(Difference Relative to Baseline Scenario, \$2010)



Discount Rate	Present Value of Fiscal Impacts
0%	\$12 Billion Net Fiscal Benefit
3%	\$16 Billion Net Fiscal Cost
5%	\$27 Billion Net Fiscal Cost
7%	\$34 Billion Net Fiscal Cost

With economic benefits 20 times greater than fiscal costs, the IECA policies provide U.S. taxpayers with significant “bang for the buck”.

Program Costs vs. Change in GDP  
(Difference Relative to Baseline Scenario, \$2010)



Source: Keybridge Research and University of Maryland Inforum Modeling Project.  
\*Values discounted at a 5% rate.

# CONCLUSIONS FOR POLICYMAKERS

The modeling results indicate that the IECA policy recommendations are likely to achieve the stated objectives of improving economic growth, reducing investment barriers, creating jobs, enhancing competitiveness, and reducing GHG emissions. Specifically, the study finds that the IECA policy package would:<sup>1</sup>

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