



# **Estimating the Benefits to the U.S. from Natural Gas Exports**

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The Washington Energy Forum—EPRINC Embassy Series  
LNG Exports from North America: Understanding the Policy Debate  
Co-hosted with the Embassy of the Russian Federation  
January 29, 2013

# The “NERA Study” of Macroeconomic Impacts of LNG Exports



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- The NERA study was commissioned by DOE/FE to build on an EIA study of U.S. natural gas prices at specified levels of exports
  - The NERA study will be considered by DOE in its decisions about granting LNG export licenses to non-FTA destinations
- What the EIA Study did
  - Determined the change in domestic natural gas price for an increase in exports specified by DOE/FE
  - Determined the change in U.S. supply and disposition of natural gas in each of those cases
- What the NERA study added
  - International natural gas market factors that influence export volumes and the prices at which they can be sold
  - Macroeconomic impacts on the U.S. economy from LNG export expansion

# Overview of NERA Methodology



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## Global Natural Gas Model

A 12 region model of world natural gas supply and demand with and capacity constraints on LNG and pipeline exports

LNG Exports

## N<sub>ew</sub>ERA Model

A dynamic general equilibrium model of the U.S. economy with 5 energy sectors  
7 industrial sectors

U.S. Exports and Wellhead Prices

## Macroeconomic Impacts

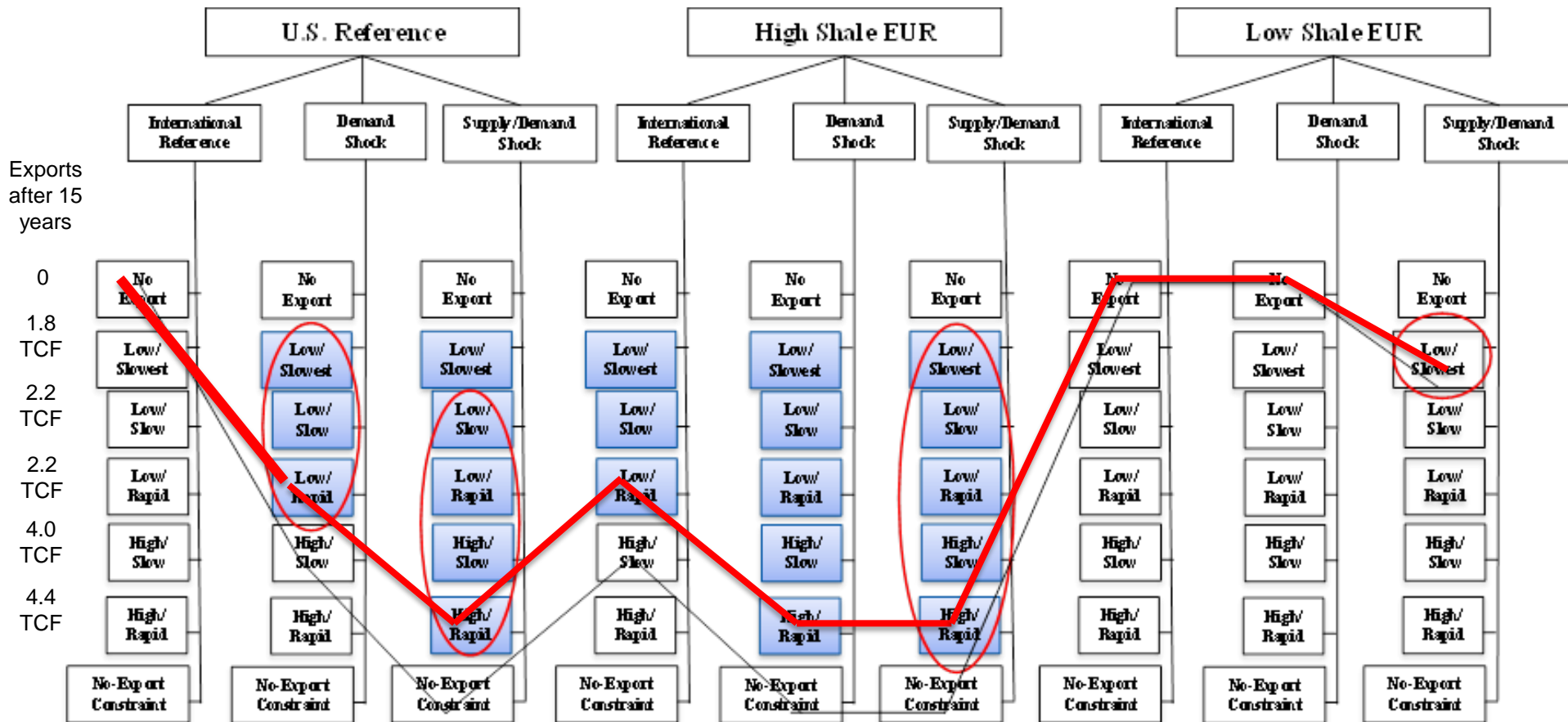
(welfare, GDP, income components)

# 63 Scenarios Were Initially Considered



BLUE indicates maximum export level is achieved in the highlighted scenario

Below the RED line raising the maximum results in no change in predicted exports



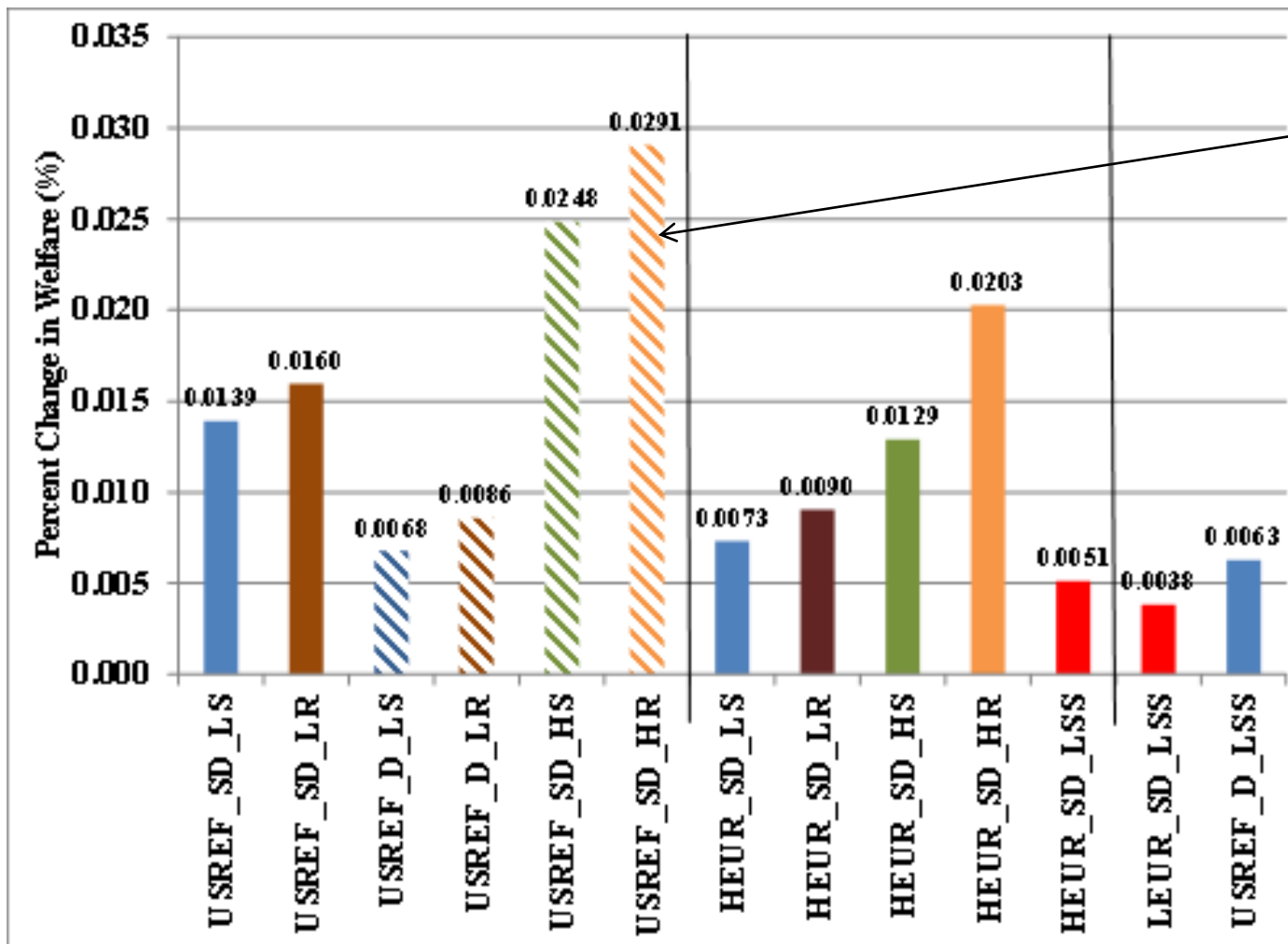
# Price Increases Attributable to Exports



**Prices and Export Levels in Representative Scenarios for Year 2035**

U.S. Scenarios	International Scenarios	Quota Scenarios	U.S. Wellhead Price (2010\$/Mcf)	U.S. Export (Tcf)	Price Relative to Reference case (2010\$/Mcf)
USREF	INTREF	NX	\$6.41		
USREF	INTREF	NC	\$6.41	0	\$0.00
USREF	D	HR	\$6.66	1.37	\$0.25
USREF	D	NC	\$6.66	1.37	\$0.25
USREF	SD	HR	\$7.24	4.38	\$0.83
USREF	SD	NC	\$7.50	5.75	\$1.09
HEUR	INTREF	NX	\$4.88		
HEUR	INTREF	LR	\$5.16	2.19	\$0.28
HEUR	INTREF	NC	\$5.31	3.38	\$0.43
HEUR	D	NC	\$5.60	5.61	\$0.72
HEUR	SD	LSS	\$5.16	2.19	\$0.28
HEUR	SD	NC	\$5.97	8.39	\$1.09
LEUR	INTREF	NX	\$8.70		
LEUR	INTREF	NC	\$8.70	0	\$0.00
LEUR	D	NC	\$8.70	0	\$0.00
LEUR	SD	NC	\$8.86	0.52	\$0.16

# Welfare Change is Positive for All Scenarios



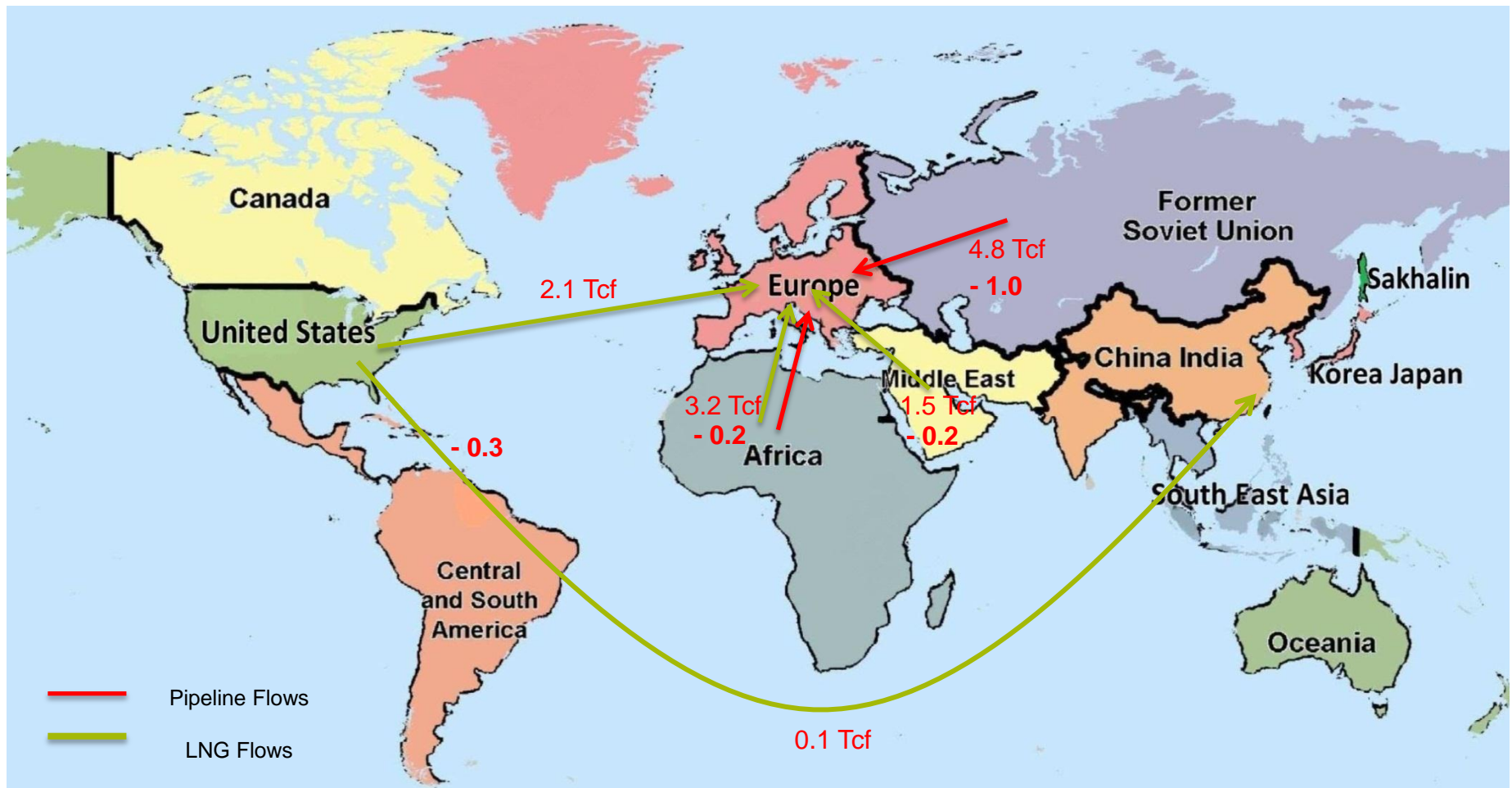
An example of more detailed impacts

Cross-hatch indicates that exports are below maximum permitted levels

# European Gas Imports After 5 Years



- Additional LNG imports from the U.S. to Europe displace imports from the Middle East, Central and South America and FSU.

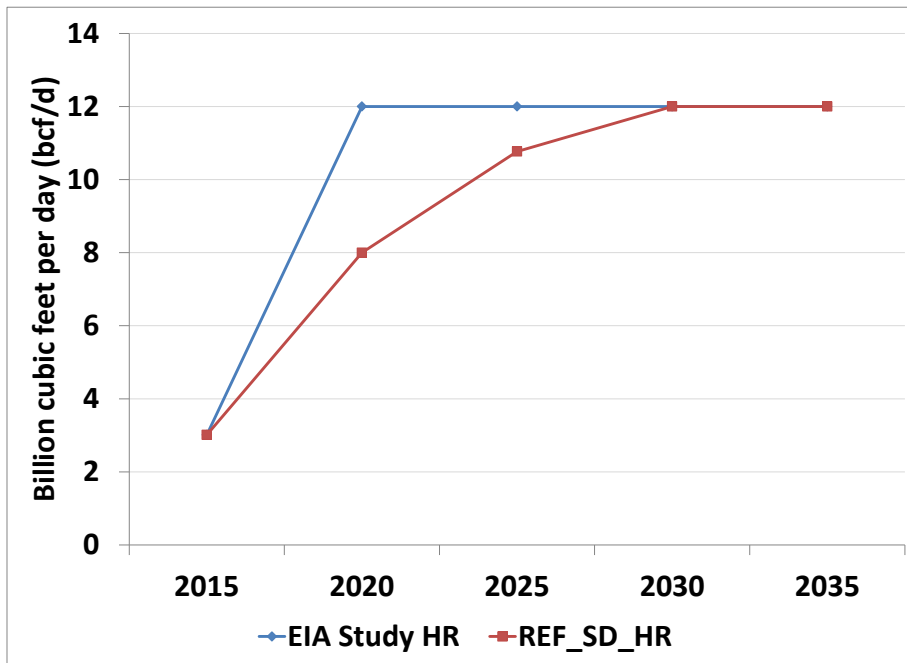


# Export Levels and Price Impacts Are Limited by Global Demand

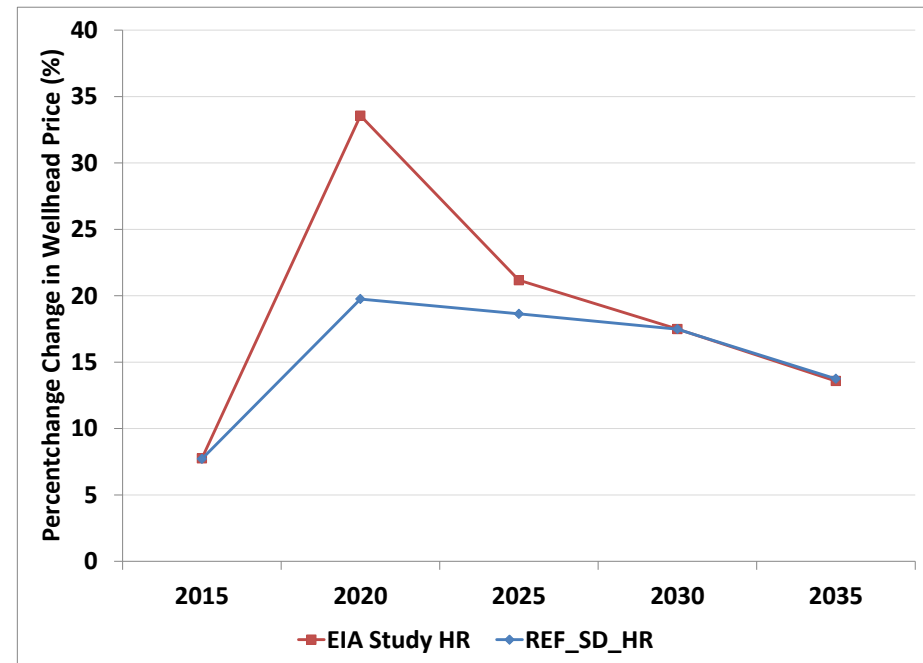


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## Exports Rise More Slowly Than DOE Export Limits

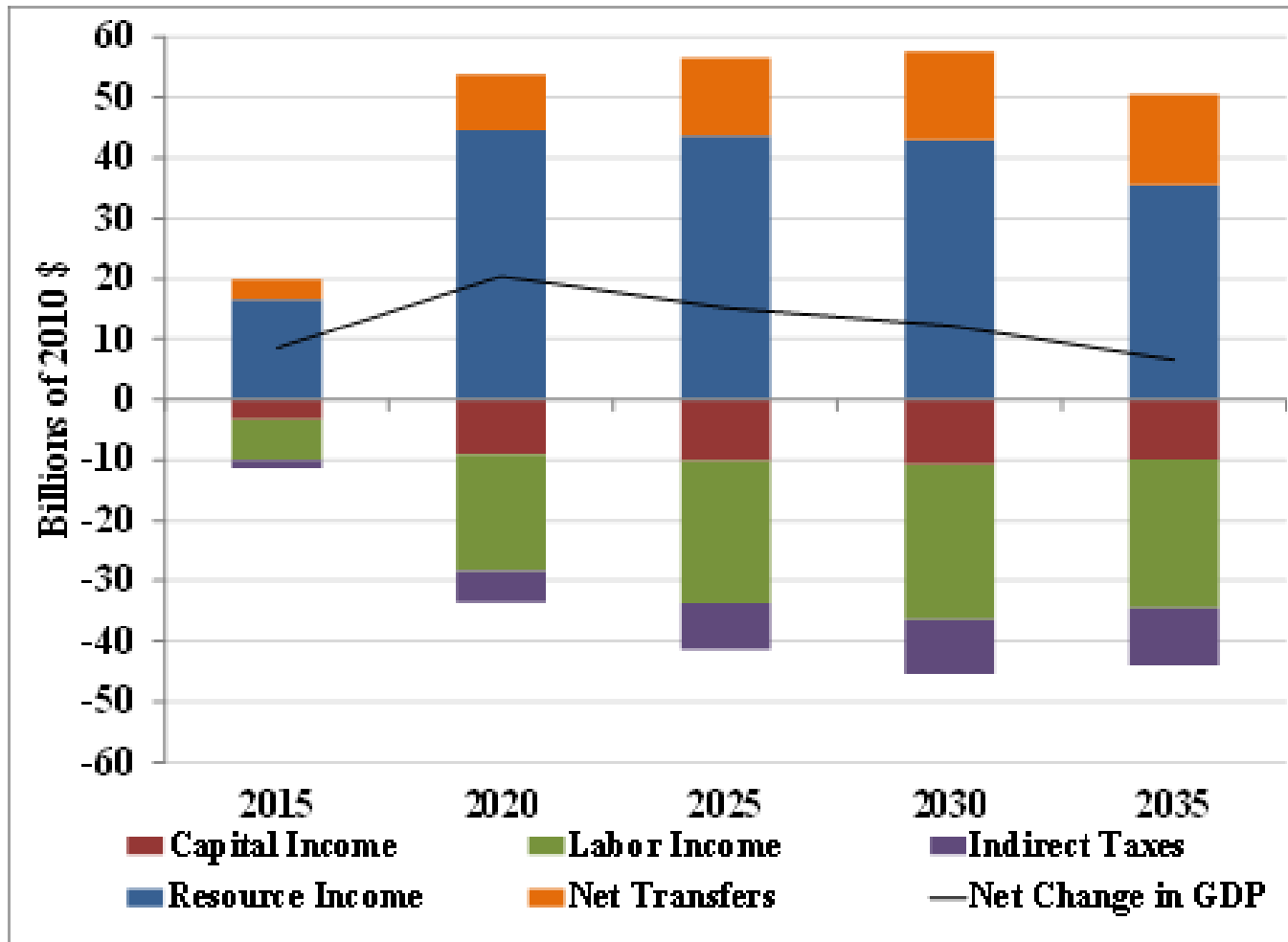


## Wellhead Prices Never Reach Peak Levels Projected by EIA





# Sources of Personal Income Shift When LNG Is Exported

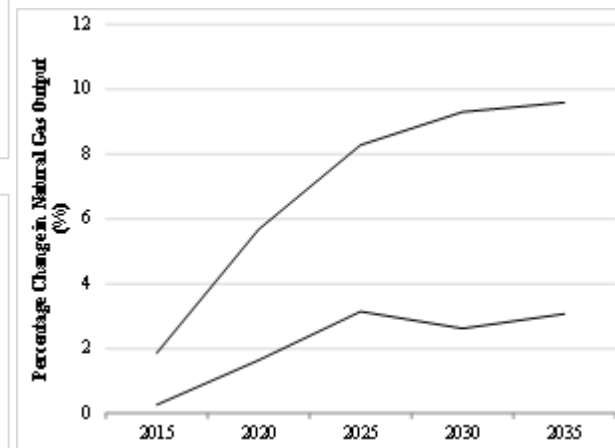
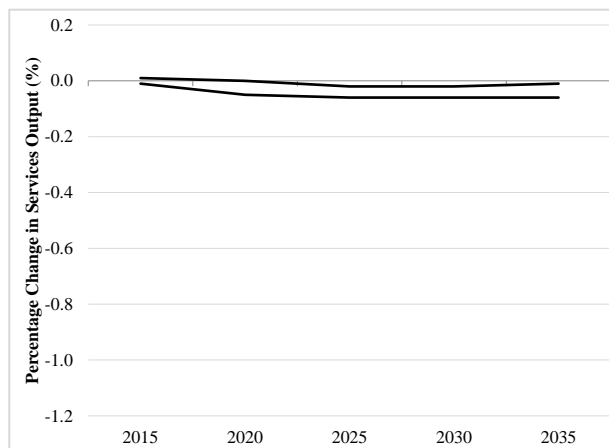
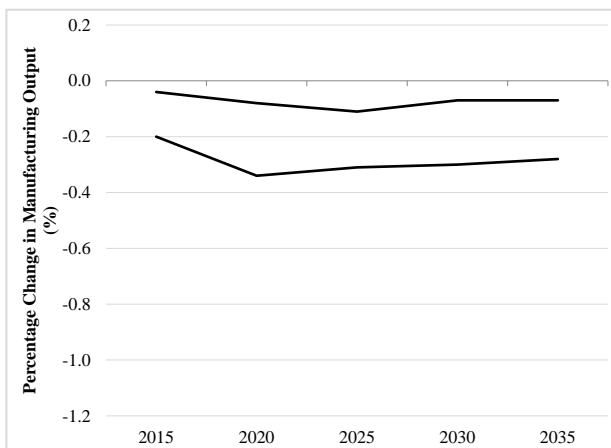
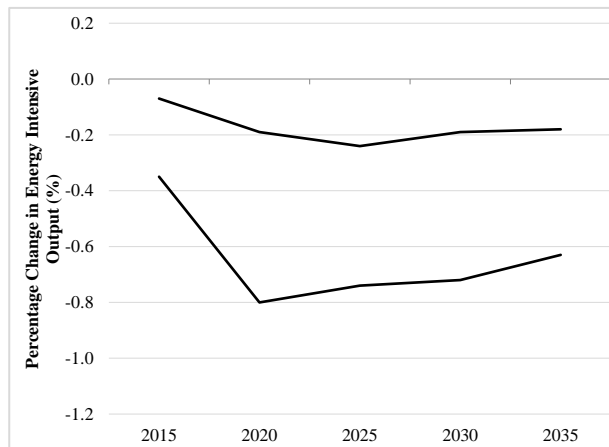
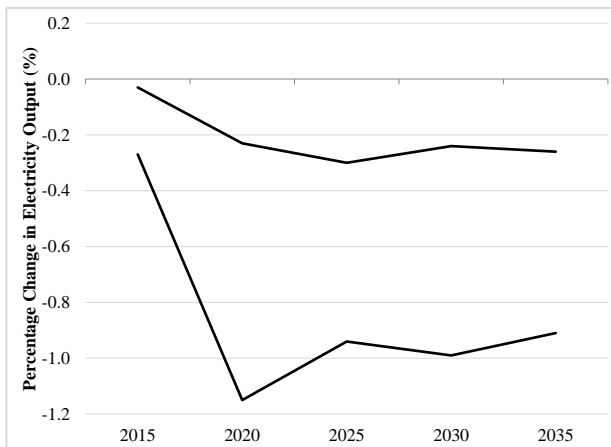


Note: Wealth transfers could also be shown as part of capital income and indirect taxes. This treatment would offset some of the decline in those two income categories.

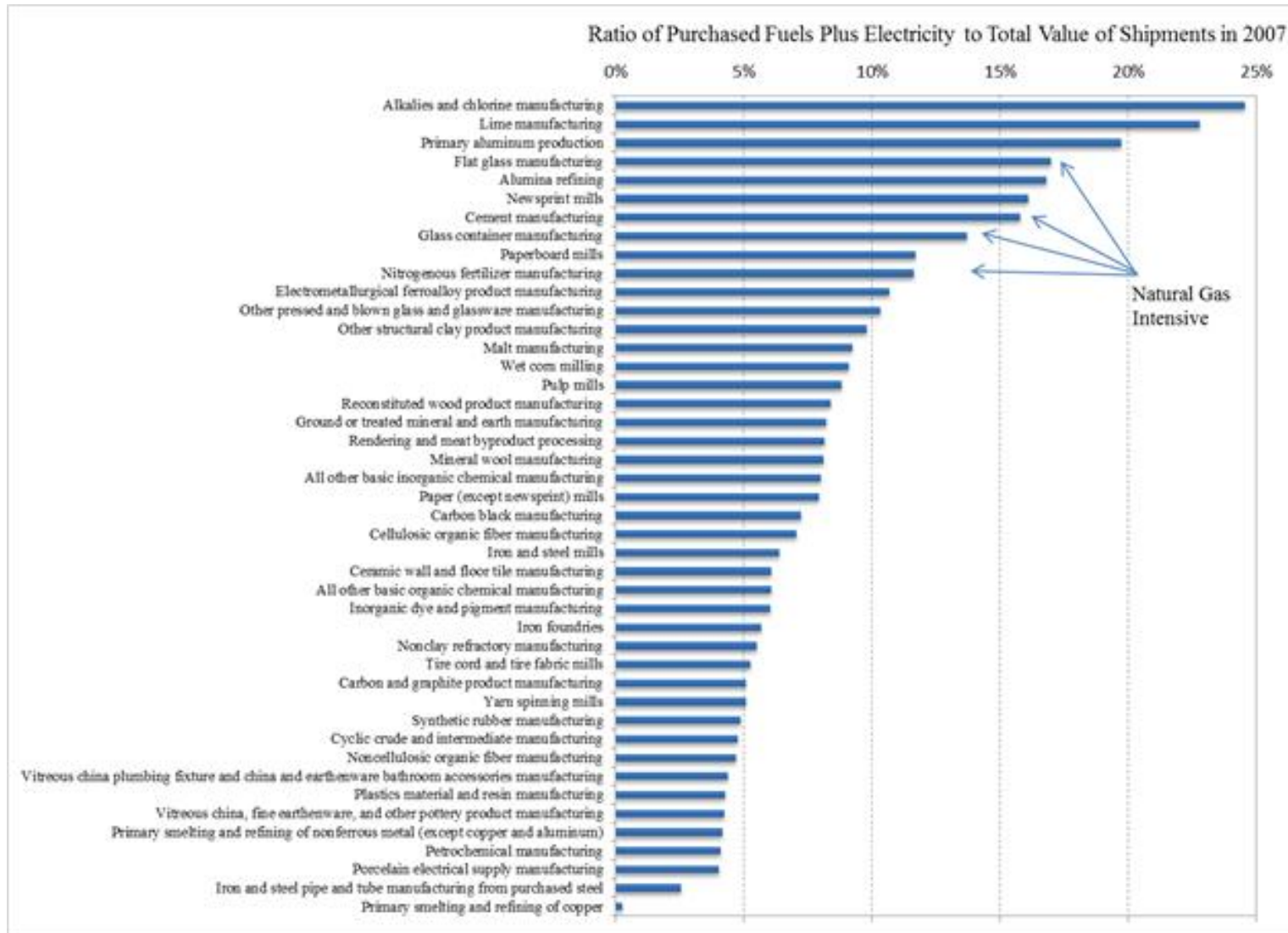
# Export Expansion will Result in Increased Natural Gas Output and Very Small Losses in Other Industries



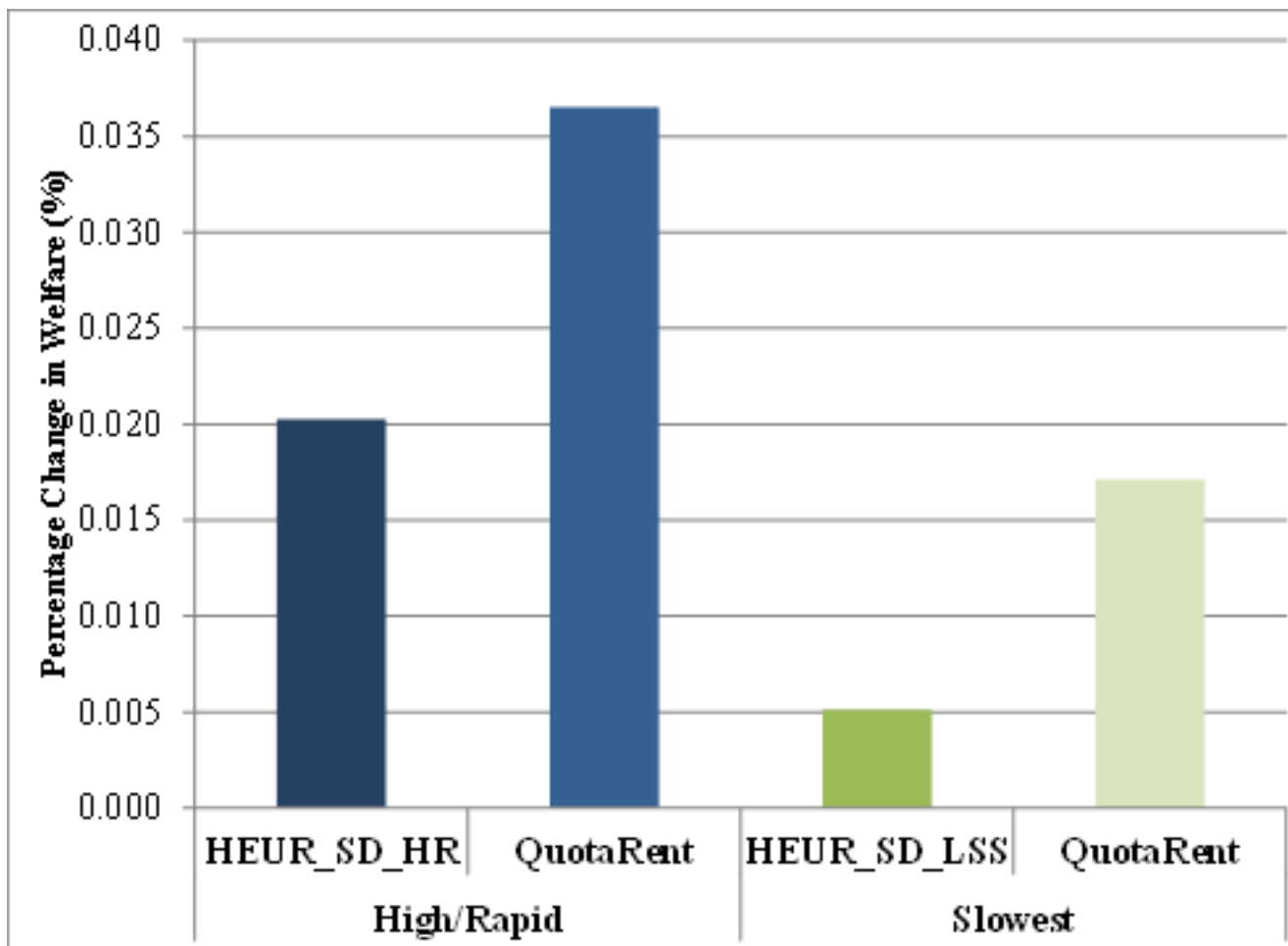
Largest and smallest output changes across all export scenarios



# Only Narrow Slices of Industry with High Energy Intensity and Low Value-Added Might Suffer Noticeable Impacts



# Net Benefits Improve if U.S. Companies Claim Quota Rents That Go Offshore Under Current Business Models





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