Statement of Toby Mack, EEIA President, Before the
U.S Senate Committee on Small Business and Entrepreneurship
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ENERGY EQUIPMENT AND INFRASTRUCTURE ALLIANCE

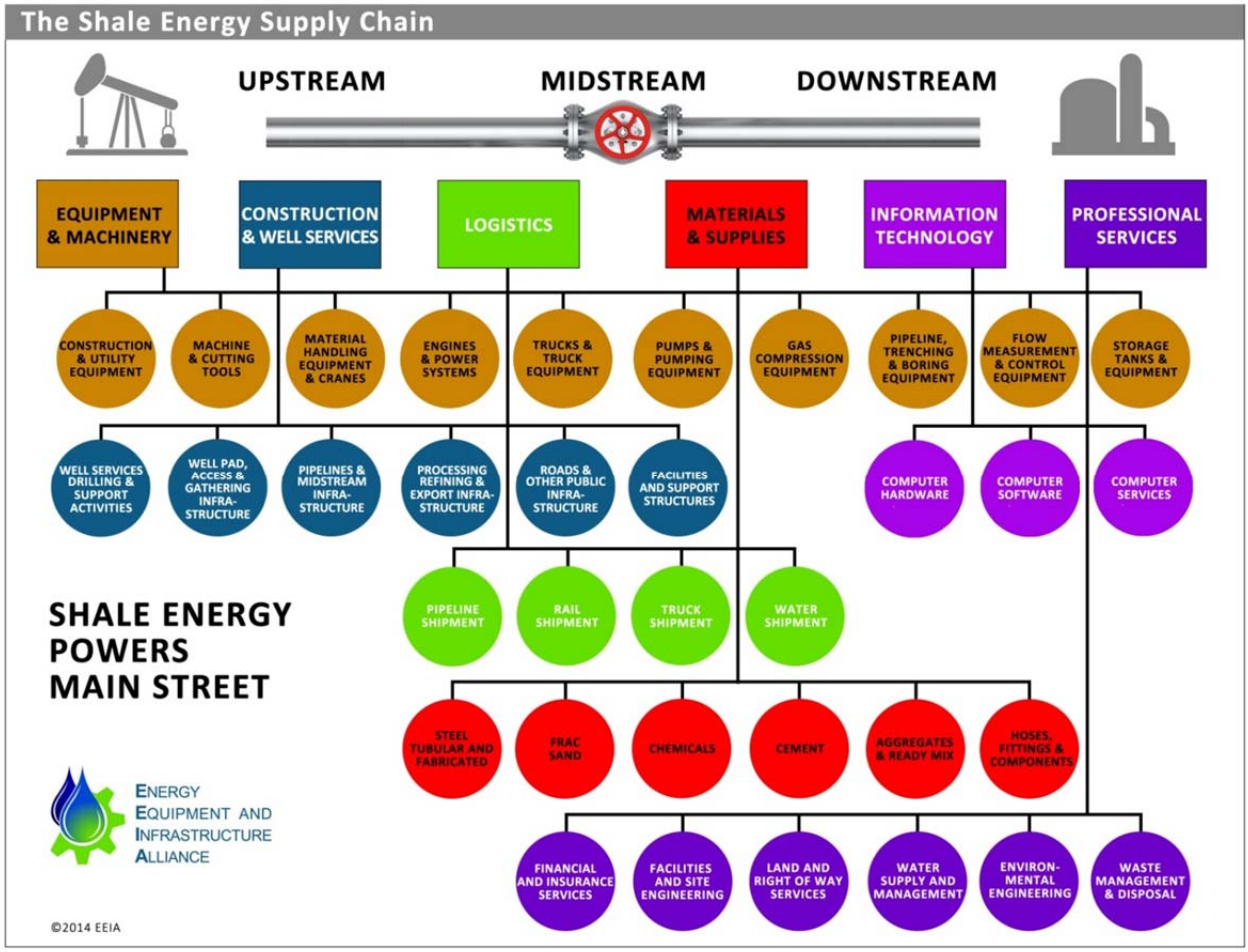
Challenges and Opportunities for Small Businesses Engaged in Energy Development and Energy Intensive Manufacturing

The Energy Equipment and Infrastructure Alliance (EEIA) is an organization of companies, trade associations and unions that represent the businesses and workers of the shale oil and gas supply chain. Our organization strongly supports free trade in energy, including liquefied natural gas, crude oil and refined petroleum products. Policies that support increased exports of energy will result in a great number of new well-paying jobs and strong growth of business output in the American energy supply chain, and especially for its many small businesses.

Before we address the benefits to small businesses in the supply chain of increased natural gas and LNG production, I'd like first to define the supply chain. Much of the recent dramatic growth in US oil and gas production has come from horizontal drilling and hydraulic fracturing in America's shale formations. This is important for today's hearing because the supply chain that supports natural gas and crude oil production from shale is remarkably large, diverse and widely distributed throughout the United States.

Equipment, products and services provided by the supply chain in support of shale energy operations are produced by businesses and workers in all 50 states. They are found in 60 different industries, which fall within six sectors, each with its own tremendous variety of businesses and occupations. Here is a summary of the products and services supplied by these sectors, which are also depicted graphically on the supply chain diagram that follows:

1. **Equipment and machinery manufacturing, distribution, rental and maintenance**; including earthmoving, material handling, drilling, pumping, power generation and distribution, machine tools and welding equipment. Also trucks, tanks, engines, compressors, and well-head equipment.
2. **Construction of production, storage and transportation facilities**; including well-site and access infrastructure, gathering systems, storage and processing facilities, transmission pipelines; also services directly supporting drilling and production activities
3. **Logistics**: including hauling of equipment, materials and supplies to and from production sites; and truck, pipeline and rail transportation of both energy products and drilling waste away from the sites
4. **Materials, supplies and components**; including steel and other metals, drilling solution, cement, concrete, industrial gasses, fracturing fluids, sand, pipe, valves, fittings, and flow control and electrical components
5. **Information technology**; including computers, software and services for exploration, process measurement and control, and data management and analysis
6. **Professional, financial and other services**; including architectural, environmental and facilities engineering; water and waste management services; financial, real estate and insurance services



To understand the breadth, depth and diversity of the supply chain, consider that almost every product or service has its own supply chain, consisting of businesses and workers that may be one or two steps removed from the production site, but whose jobs and output are ultimately driven by shale gas and oil production.

To illustrate, take the example of a piece of earthmoving machinery used to grade a drilling pad, carve out access roads, or dig foundations and trenches for oil and gas gathering, storage and transmission systems.

Now consider what goes into manufacturing that machine and putting it to work on the energy production site. There's raw steel, fabricated steel plate and forgings; the machine tools that cut, bend, machine and weld steel components; steel buckets, teeth and attachments; a high-horsepower engine and transmission and their components; hydraulic cylinders and components; steel sprockets and tracks or huge rubber tires; electrical and electronic controls and components; plus all the necessary hoses, valves, filters, gaskets, lubricants, and fuel. Then there's the preparation, maintenance and delivery of the machine to the production site by the dealer or rental company. And last but far from least, there's a skilled operator needed to run the machine safely and efficiently and deliver the work it's designed to produce.

The machine's manufacturer has thousands of its own suppliers of components, materials and services that go into building it and putting it to work. And their suppliers have suppliers and so on down the supply chain line, until you get to raw material. The vast majority of these businesses are smaller local and regional firms. They and their workers are all essential to building the machine, and they are all ultimately dependent on energy production to create the demand for manufacturing that machine and the jobs that go with it. A similar story can be told for every product or service used in energy production.

Now let's turn to the shale supply chain's economic and employment dimensions. Based on energy industry studies, EEIA estimates that there are at least 120,000 energy supply chain businesses, more than 100,000 of which are small businesses. Late last year, the research firm IHS published a study[1] of the extent of supply chain jobs and output generated by U.S. unconventional oil and gas operations. It reported that in 2015, the supply chain workforce consists of 615,000 jobs, growing to 757,000 by 2025, for 23% growth. Output in 2015 is $173 billion, growing to $206 billion by 2025 (in constant dollars), for 20% growth. These are base case numbers that assume that our current restrictive energy export policies remain in effect. The study also documents that energy supply chain workers earn, on average, $79,000 per year, versus $68,000 for all American workers. IHS also estimates that for every direct job involved in energy production, three more jobs are created in the supply chain and 6 more in communities where workers live, shop and eat.

Consider the potential for new supply chain jobs throughout the US, when additional natural gas is produced to supply LNG export markets. In the IHS Economics study, America's New Energy Future[2], twenty-four supply chain industries were forecast to have a total of 515,000 jobs supporting natural gas production from shale in 2015, growing to 655,000 jobs by 2020. At the same time, shale gas production was estimated by the U.S. Energy Information Administration (EIA) to reach 44 billion cubic feet per day (bdf/d) in 2015 and almost 60 bcf/d by 2020. This calculates to a ratio of over 11,000 supply chain jobs per bcf/d. EIA also reports that virtually all growth in U.S. natural gas production will come from shale. The chart below identifies the supply chain industry sectors where these jobs are created:

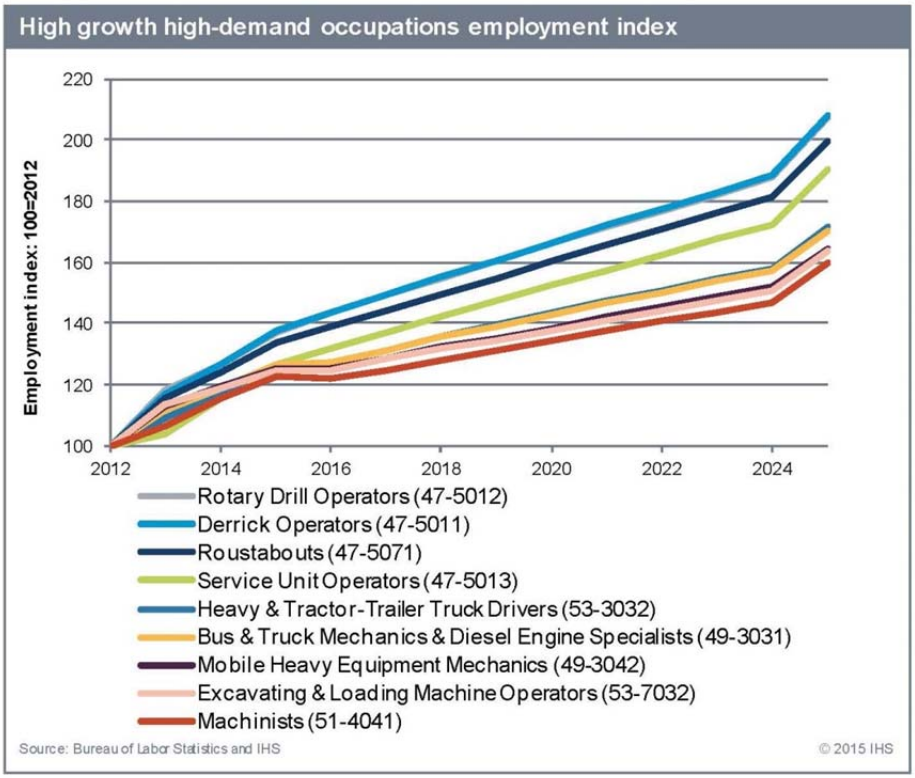
		BCF/D Natural Gas from Shale (EIA):	**44.27**	**59.53**		
			TOTAL JOBS		**JOBS PER BCF/D**	
NAICS	**Supply Chain Industry**		**2015**	**2020**	**2015**	**2020**
212	Sand and Gravel Mining		25,104	32,631	567	548
213	Support Activities for Drilling		35,387	46,540	799	782
23	Construction		80,362	99,021	1,815	1,663
325	Chemicals Manufacturing		10,052	13,052	227	219
326	Plastics and Rubber Products Manufacturing		5,835	7,345	132	123
327	Non-metallic mineral Products Manufacturing		3,736	4,756	84	80
331	Primary Metal Manufacturing		14,339	18,556	324	312
332	Fabricated Metal Products Manufacturing		30,165	37,710	681	633
333	Machinery Manufacturing		50,852	66,340	1,149	1,114
334	Computer and Electronic Product Manufacturing		6,768	8,530	153	143
335	Electrical Equipment and Components Manufacturing		444	560	10	9
336	Transportation Equipment Manufacturing		4,927	6,190	111	104
42	Machinery, Equipment and Supplies Wholesalers		44,739	56,520	1,011	949
441	Dealers of Motor Vehicles Parts		13,129	16,450	297	276
482	Transportation - Rail		1,953	2,495	44	42
483	Transportation - Water		387	491	9	8
484	Transportation - Truck		23,998	31,602	542	531
486	Transportation - Pipeline		811	1,003	18	17
493	Warehousing & Storage		5,075	6,428	115	108
524	Insurance		22,569	28,590	510	480
532	Rental and Leasing		8,228	10,329	186	174
541	Services - Professional, Technical and Scientific		105,412	133,587	2,381	2,244
562	Waste Management and Remediation		2,441	3,081	55	52
811	Repair and Maintenance		18,506	23,283	418	391
			515,219	655,090	11,638	11,004

Recent approvals of applications for licenses by the Department of Energy to export LNG to non-Free Trade Agreement countries anticipate that between late 2015 and 2018, liquefaction and export capacity will reach about 10 bcf/d, requiring that much additional natural gas production from shale beyond the EIA forecast. If the linear relationship between supply chain jobs and natural gas production holds, we can look forward to over 100,000 new supply chain jobs over the next four years.

That equates to an additional $8 billion of annual income to American workers, which we know will be spent in local communities throughout the United States as these new supply chain workers improve their standards of living; consuming, paying taxes in and supporting the economies of their local communities. Using the Small Business Administration estimate that half of American workers are employed by small business, we project that of the forecast job gains, supply chain small businesses would be responsible for creating at least half of them.

Those numbers could grow substantially further, if additional LNG export license applications are approved, and as the United States expands its circle of free-trade agreement countries through agreements such at the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP), facilitated by Congress' recent action to grant Trade Promotion Authority to the Administration.

It should be noted that much of this supply chain job growth will be concentrated in skill areas that require technical training but not necessarily four-year or higher degrees. Supply chain companies will be challenged to fill positions in high-growth, high-demand occupations, the need for which will as much as double between 2012 and 2025, according to IHS Economics. This chart shows the highest growth occupations.



The supply chain is truly national, and not confined to oil and natural gas producing areas. Since both natural gas and crude oil production rely on essentially the same supply chain, we can clearly see this effect by looking at the geographic distribution of job gains that occur when crude oil production grows. Of the top fifteen states by job gains if crude oil production were increased for export, ten are states in which very little or no crude oil is produced. In fact the state of Illinois, because of the prominence of manufacturing capital equipment used in energy production, ranks third behind Texas and California in jobs gained with increased shale energy production.

	Base	Potential
CA	43,129	57,338
TX	32,279	40,599
IL	17,644	26,909
NY	13,956	24,605
FL	12,213	22,481
OH	10,475	13,601
GA	7,520	13,271
MI	8,109	13,256
PA	7,325	13,251
WA	8,204	12,903
NC	7,085	12,664
MA	7,568	12,046
OK	7,628	11,006
WI	6,264	10,219
MD	6,238	9,911

In another example, in 2014 total unconventional energy operations in Louisiana supported 109,000 jobs, of which 66,000, or 60%, are in found in the supply chain, according to IHS Economics. These data only includes activity in support of energy produced from shale, and not conventional reservoir-based production.

In summary, exports of LNG, and for that matter all energy exports including crude oil, will support additional domestic energy production from our large and rapidly growing reserves by our innovative and productive energy sector. America's shale energy production renaissance has been the principal contributor to our emergence from the recent deep recession. It has the potential to spur substantially more job creation throughout the country if Congress acts wisely and adopts policies that facilitate exports. The particularly positive impact will be on small businesses that dominate the supply chain, who will thrive and grow on America's Main Street in all 50 states.

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[1] IHS Economics, Supplying the Unconventional Revolution, September 2014
[2] IHS Economics, America's New Energy Future, Volume 1, October 2012