U.S. Environmental Protection Agency

Office of Air Quality Planning and Standards

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Economic Impact and Small Business Analysis –Mineral Wool and Wool Fiberglass RTRs and Wool Fiberglass Area Source NESHAP

1. Introduction

This report is the economic impact analysis for the final Mineral Wool Production and Wool Fiberglass Manufacturing Risk and Technology Review (RTR) standards and also the final Wool Fiberglass Area Source NESHAP. Promulgation of these standards is scheduled to occur under court-order on June 25, 2015. The report presents impacts to firms affected by the requirements in the rules and their consumers. Results are presented individually for each final rule, and a discussion of cumulative impacts from all 3 rules is presented at the end of the report. Impacts to small firms are accounted for in adherence to the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). The industries affected by this rulemaking are found in NAICS 327993.

This final action is the culmination of three proposals, including supplemental proposals. On November 25, 2011 (76 FR 72770), the EPA proposed revisions to the Mineral Wool Production and Wool Fiberglass Manufacturing NESHAP based on the risk and technology review which was conducted under Clean Air Act (CAA) sections 112(f)(2) and (d)(6). The EPA proposed to discontinue using formaldehyde as a surrogate for phenol and methanol in both source categories, and discontinue using carbon monoxide (CO) as a surrogate for carbonyl sulfide (COS) in the Mineral Wool Production source category. The EPA also proposed MACT standards under CAA sections 112(d)(2) and (3) for hazardous air pollutants (HAP) that were previously unregulated or that had previously been regulated by a surrogate. The limits in those proposed amendments would apply only to major sources, that is, sources emitting at least 10 tons per year of a single HAP or 25 tons per year of any combination of HAP; area sources emit less than this amount.

On April 15, 2013 (78 FR 22370), the EPA issued a supplemental proposal that was based on comments and new information we received after the November 2011 proposal. In that action EPA proposed first-time standards for area sources in the Wool Fiberglass Manufacturing source category.

On November 13, 2014 (79 FR 68012), the EPA issued a second supplemental proposal to explain changes to previously proposed emissions limits for sources in these source categories, proposed work practice standards under CAA section 112(h) in lieu of certain emission limits, and clarified the EPA's use of the upper predictive limit (UPL) in setting Maximum Achievable Control Technology (MACT) floors.

This final action includes chromium emission limits for gas-fired glass-melting furnaces used to make wool fiberglass that are located at area sources (to be subject to subpart NN) and amends the existing major source rules for Mineral Wool Production (subject to subpart DDD) and Wool Fiberglass Manufacturing (subject to NNN). It also adds these sources to the source category list for the Urban Air Toxics Strategy of the Clean Air Act.

1.A. Summary of November 2011 revisions

On November 25, 2011 (76 FR 72770) the EPA proposed revisions to the Mineral Wool and the Wool Fiberglass Manufacturing NESHAP, 40 CFR part 63, subparts DDD and NNN, respectively, to address the results of the residual risk and technology review (RTR) that the EPA is required to conduct under sections 112(d)(6) and 112(f)(2)(at 76 FR 72812). In the November 25, 2011 notice, we proposed several amendments to both NESHAP and announced our intention to list and regulate area sources in the wool fiberglass area source category pending the collection of new test data.

The agency also noted that since promulgation of the 1999 NESHAP, at least 20 of the existing 30 wool fiberglass facilities are now exempt from the rule due to elimination of phenol-formaldehyde binders and are also area sources. As noted previously, a facility that no longer uses phenol-formaldehyde binders does not meet the definition of "wool fiberglass facility" under Subpart NNN. However, the glass-melting furnaces at these sources continue to emit chromium and other HAP metal compounds, and are completely separate and independent from emissions from the bonding portion of the process. Further, while replacement of phenol-formaldehyde binders with non-HAP binders is an environmentally responsible, or 'green' choice within the wool fiberglass manufacturing industry, recent data from industry show that gas-fired glass-melting furnaces specifically continue to emit chromium and other HAP metal compounds, and for furnaces located at area sources these emissions are not currently regulated pursuant to CAA section 112. We are now including regulation of wool fiberglass area sources in this final rule as a new subpart, NN.

1.B. Summary of the April 15, 2013 supplemental proposal.

On April 15, 2013 (78 FR 22370), the EPA published a supplemental proposal to the RTR. The supplemental proposal made corrections to the November 2011 proposal for both source categories, responded to comments, and proposed first time standards for gas-fired glass-melting furnaces at area sources in the wool fiberglass source category under EPA's urban air toxics strategy (Strategy) as required by CAA Sections 112(c)(3) and 112(k)(3)(B)(ii).

1.C. Summary of the November 13, 2014 supplemental proposal.

On November 13, 2014 (79 FR 68012), the EPA issued a second supplemental proposal to explain changes to previously proposed emissions limits for sources in these source categories, proposed work practice standards under CAA section 112(h) in lieu of certain emission limits, clarified our use of the upper predictive limit (UPL) in setting Maximum Achievable Control Technology (MACT) floors, revised startup and shutdown standards for both source categories

1.D. What is the purpose of this final rule?

Mineral Wool Production

For the Mineral Wool Production source category, regulated under subpart DDD, the EPA is finalizing the emissions limits as proposed in the November 2014 supplemental proposal. The EPA is removing the surrogacy of CO for COS and finalizing COS emission limits for two subcategories of cupolas according to design (open-top or closed –top). The EPA is finalizing emission limits for HF an HCl for two subcategories of cupolas according to raw material use (those processing slag and those not processing slag). The EPA is also removing the surrogacy of formaldehyde for phenol and methanol and finalizing emission limits for formaldehyde, methanol and phenol from three subcategories of bonded lines according to design (horizontal, vertical, or drum). The EPA is not amending the PM emission limit for the Mineral Wool Production source category.

Wool Fiberglass Manufacturing Major Sources (NNN)

For the Wool Fiberglass Manufacturing source category, the EPA is finalizing emission limits for chromium compounds from gas-fired glass-melting furnaces at major sources

(regulated under subpart NNN). The final chromium emission limits are slightly higher than previously proposed.

The EPA is amending the PM limit for all furnaces at major sources subject to NNN to 0.33 lb/ton (down from 0.5 lb/ton).

The EPA is also removing the surrogacy of formaldehyde for phenol and methanol, and finalizing emission limits for phenol, formaldehyde and methanol emissions from existing and new FA lines subject to NNN. The applicability of the rule as it applies to FA lines is being amended by the final rule. In this final rule, all FA lines are subject to the FA line emission limits regardless of the product manufactured.

The EPA is deferring amending emission limits for RS lines pending new information to be collected under section 114 authority.

Wool Fiberglass Manufacturing Area Sources (NN)

For the Wool Fiberglass Manufacturing source category, the EPA is finalizing emission limits for chromium compounds from gas-fired glass-melting furnaces at area sources (regulated under a new subpart NN). The emission limits for area sources are slightly higher than previously proposed, and are the same as those for major sources.

We estimate the economic impacts of these standards in this report for all of the different rules covered in this final rulemaking.

2. The Mineral Wool Industry

2.A. Background on Mineral Wool Industry

Mineral wool often is defined as any fibrous glassy substance made from minerals or mineral products such as slag and glass. The chemical composition of mineral wool can vary widely. The basic materials for glass wool manufacture include sand, soda ash, dolomite, limestone, sodium sulfate, sodium nitrate, and minerals containing boron and alumina. Traditional stone wool production involves melting a combination of alumino-silicate rock (usually basalt), blast furnace slag, and limestone or dolomite. In addition, for both glass and stone wool the batch may contain recycled process or product waste. For glass wool, other forms of waste glass (cullet) are also used as feedstock.

These materials are processed into insulation and other fibrous building materials that are used for structural strength and fire resistance. Generally, these products take one of four forms: "blowing" wool or "pouring" wool, which is put into the structural spaces of buildings; batts, which may be covered with a vapor barrier of paper or foil and are shaped to fit between the structural members of buildings; industrial and commercial products such as high-density fiber felts and blankets, which are used for insulating boilers, ovens, pipes, refrigerators, and other process equipment; and bulk fiber, which is used as a raw material in manufacturing other products, such as ceiling tile, wall board, spray-on insulation, cement, and mortar.

Glass wool and stone wool production make use of different proprietary technologies, including melting, fiberizing and curing. Production of mineral wool is a high temperature, energy intensive process. Mineral wool plants use a mix of technologies and fuels: a total of 11 proprietary fiberizing technologies are employed worldwide. Glass wool furnaces are predominantly gas fired, but there are a substantial number of furnaces that are electrically heated.

In the production of mineral wool products that do not require high rigidity, oil is typically applied to suppress dust and add some strength to the fiber; the fiber is then sized and bagged or baled. This is known as a "nonbonded" product which is manufactured on a "nonbonded" production line.

For mineral wool products requiring a higher structural rigidity, a HAP-based (phenol/formaldehyde) binder may be applied to the fiber. This is known as a "bonded" product made on a bonded production line. The binder-laden fiber mat is then thermoset in a curing oven and cooled. The major differences between the "nonbonded" and bonded production lines are the application of binder during the collection process followed by the curing oven. Four facilities only manufacture nonbonded products, while the other 3 facilities operate both bonded and nonbonded production lines. A total of 11 cupolas and 3 curing ovens are operated by the facilities in this source category.

2.B. Economic Impact Estimates

As mentioned previously, mineral wool manufacturing facilities are included in NAICS 327993. The industry's revenue for 2012 was reported at $5.6 billion, and the estimated gross profit was 32.07%. Exports from US mineral wool firms exceeded imports by about $600

million in 2012.[1] The year 2012 is the most recent year for which we are able to obtain economic data for NAICS 327993. According to the size definition applied to this industry by the U.S. Small Business Administration (SBA) (750 company employees or less)[2], five of the seven parent firms in this industry affected by this final rule are classified as small businesses. Of the five small firms, their average number of employees is 108. All of these firms are U.S. owned except for Roxul USA. Roxul USA is a subsidiary of a Danish company, Rockwool International, which is the world's largest producer of mineral wool insulation. Roxul USA's facility is located in Byhalia, Mississippi. Roxul USA broke ground in 2012 and completed construction on the new facility in 2014. Roxul USA uses a different cupola design (similar to others used in Europe) to produce mineral wool and bonded products. This facility will be subject to the amended emission limits for new sources in the Mineral Wool Production MACT rule. The company is not a small business. We have included this new production facility as part of the estimated cost impacts. Based on the emissions test data provided by the industry, none of the existing facilities will have to install additional control equipment to comply with the proposed rule requirements.

We estimate that all 8 of the mineral wool production facilities will incur additional testing costs to demonstrate compliance with the new carbonyl sulfide (COS), hydrochloric acid (HCl), and hydrofluoric acid (HF) emission limits for cupolas. We also estimate that the 3 existing facilities with bonded product lines will incur additional testing costs to demonstrate compliance with the revised formaldehyde and new phenol and methanol emission limits that will apply to collection and curing operations combined. We only have general information on the planned new facility but to estimate costs conservatively, we assume in the cost estimation that it would operate two cupolas and two bonded product lines that would be subject to the limits in the rule. All of the new testing associated with the final rule requirements is based on a 5-year frequency. Therefore, the initial (first year) testing costs were divided by 5 to come up with "annualized" testing costs.

This economic analysis identified the businesses that will be affected by this rule and provides an analysis at a screening level to assist in determining whether this rule is likely to

[1] Mineral Wool Manufacturing Industry in the U.S. and its International Trade (2014 Edition). LLC Supplier Relations US. Available on February 17, 2014. Can be found at http://www.marketresearch.com/Supplier-Relations-US-LLC-v3418/Mineral-Wool-Manufacturing-International-Trade-8033092/.

[2] Found at the web site for the U.S. Small Business Administration (http://www.sba.gov/size), with small business size standards updated as of July 14, 2014.

impose a significant economic impact on affected businesses. The analysis employed here is a "sales test" that computes the annualized compliance costs as a share of sales for each company. The annualized cost per sales for a company represents the maximum price increase in affected product needed for the company to completely recover the annualized costs imposed by the regulation. A partial equilibrium analysis, a type of economic impact analysis that estimates changes in prices and output for the regulated sector resulting from a rule's implementation, is deemed more than necessary for this final rule given the expected size of the impacts.

The "sales test" is the impact methodology EPA employs in economic impact analysis such as this one as opposed to a "profits test", in which annualized compliance costs are calculated as a share of profits.[3] This is because revenues or sales data are commonly available data for entities normally impacted by EPA regulations and profits data normally made available are often not the true profits earned by firms due to accounting and tax considerations. Firms and entities often have ways legally available in the tax code to minimize their reported profits; thus, using reported profits may lead to a less than accurate estimate of the economic impact of a regulation to an affected firm or entity and their consumers. While screening level analyses are often employed to estimate impacts to small business or entities as part an analysis in compliance with the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), a screening level analysis can also be employed in an economic impact analysis such as this one whose focus is on the regulated companies. The costs used as input to the economic impact and small business analysis include the cost of emissions control and the costs of monitoring, recordkeeping, reporting and testing. The compliance costs by mineral wool facility are shown below in Table 1, and all compliance costs are in 2013$. More details on the compliance costs can be found in the mineral wool RTR cost memo prepared for this rulemaking.[4]

[3] More information on sales and profit tests as used in analyses done by U.S. EPA can be found at http://www.epa.gov/sbrefa/documents/rfaguidance11-00-06.pdf, pp. 32-33.

[4] Memo from Danny Greene, ERG, to Susan Fairchild, US EPA. Estimated Cost Impact for Mineral Wool Production Industry to Comply with Proposed Residual Risk and Technology Review (RTR) Amendments. June 18, 2015.

Table 1. Mineral Wool Production Facilities Costs to Comply with RTR Amendments - Summary

		Cupolas[a]			Combined Collection/Curing		
Facility	**Location**	**# Cupolas**	**Annualized (New) COS Testing Cost[b]**	**Annualized (New) HCl/HF Testing Cost[b]**	**# Bonded Lines**	**Annualized (New) Testing Cost[c]**	**Total Facility Incremental Annualized (New) Costs**
Industrial Insulation Group (IIG)	Phenix City, AL	1	$2,800	$800	1	$800	$4,400
Thermafiber	Wabash IN	2	5,200	1,600	1	800	7,600
USG Interiors	Red Wing, MN	2	5,200	1,600	0	0	6,800
USG Interiors	Walworth, WI	1	2,800	800	0	0	3,600
Amerrock Products	Nolanville, TX	2	5,200	1,600	0	0	6,800
Isolatek Int'l	Huntington, IN	2	5,200	1,600	0	0	6,800
Rock Wool Mfg	Leeds, AL	1	2,800	800	1	800	4,400
Roxul USA	Byhalia, MS	2	5,200	1,600	2	1,600	8,400
	SubTotal	13	$34,400	$10,400	5	$4,000	**$48,800**

a – 8 of the 13 cupolas currently have (or will have) incineration/afterburner controls. None of the facilities are expected to have any additional equipment or material cost impacts to meet the proposed emission limits.

b – Cupola testing costs reflect incremental (new) costs for COS, HF, and HCl testing; current test requirements for PM not included.

c – Collection/curing costs reflect incremental costs for phenol and methanol testing; current test requirements for formaldehyde not included.

For these mineral wool firms, the impacts of the final rule range from 0.006 percent to 0.1 percent, expressed as annual compliance costs as a percent of sales.[5] The price elasticity of demand for mineral wool is estimated at -0.8[6], and the price elasticity of supply for mineral wool is estimated at -0.7.[7] With the responsiveness of mineral wool demand and supply being less in percentage terms than the change in product price as approximated by the cost to revenue ratio, since this ratio is the maximum price change that producers may face, and with this ratio at or below 1 percent for the majority of production from this industry, it is expected that mineral wool price and output changes in response to this final rule will be less than 1 percent.[8] The total annual compliance costs (TAC) of the final rule for this industry are $48,800 (2013 dollars) as shown in Table 1.[9] Since confidential business information (CBI), particularly revenue data, received from the subject firms has been used to estimate these impacts, we will not provide economic impact estimates by firm.

3. The Wool Fiberglass Industry

3.A. Background

Wool fiberglass is a thick, fluffy material made from discontinuous fibers, is used for thermal insulation and sound absorption. It is commonly found in ship and submarine bulkheads and hulls; automobile engine compartments and body panel liners; in furnaces and air conditioning units; acoustical wall and ceiling panels; and architectural partitions. Fiberglass can be tailored for specific applications such as Type E (electrical), used as electrical insulation

[5] Use of this metric for economic impacts when small businesses are prevalent in an industry affected by a regulation is consistent with the EPA guidance on SBREFA compliance (http://www.epa.gov/sbrefa/documents/Guidance-RegFlexAct.pdf), chapters 2 and 3.

[6] Ho, M. S, R. Morgenstern, and J. S. Shih. 2008. "Impact of Carbon Price Policies on US Industry." RFF Discussion Paper 08-37. Http://Www.Rff.Org/Publications/Pages/Publicationdetails.Aspx?. Publicationid=20680 Accessed August 2009. Table 8.A.6.

[7] Broda, C., N. Limao, and D. Weinstein. 2008b. "Export Supply Elasticities." <http://faculty. chicagobooth.edu/christian.broda/website/research/unrestricted/TradeElasticities/ TradeElasticities.html .

[8] This conclusion is consistent with the existence of perfect competition for this industry. This conclusion may change somewhat to the extent that this industry is imperfectly competitive.

[9] For more information on the costs of the rule, please refer to the cost memo prepared for this industry as part of this rule, which is a memo from Danny Greene, ERG, to Susan Fairchild, US EPA. Estimated Cost Impact for Mineral Wool Production Industry to Comply with Residual Risk and Technology Review (RTR) Amendments. June 18, 2015.

tape, textiles and reinforcement; Type C (chemical), which has superior acid resistance, and Type T, for thermal insulation.

The basic raw materials for fiberglass products are a variety of natural minerals and manufactured chemicals. The major ingredients are silica sand, limestone, and soda ash. Other ingredients may include calcined alumina, borax, feldspar, nepheline syenite, magnesite, and kaolin clay, among others. Silica sand is used as the glass former, and soda ash and limestone help primarily to lower the melting temperature. Other ingredients are used to improve certain properties, such as borides for chemical resistance and ductability. Waste glass, also called cullet, is also used as a raw material and may be 'internal' from the production of fiberglass or may be 'external' from glass recycling. The raw materials must be carefully weighed in exact quantities, their chemical compositions evaluated, and thoroughly mixed together (called batching) before being melted into glass for the manufacture of fiberglass.

3.B. Economic Impacts for Wool Fiberglass RTR Final Rule

Based on the information provided by the wool fiberglass manufacturing industry and their primary trade association, North American Insulation Manufacturers Association (NAIMA), there are currently 30 facilities in the U.S. producing wool fiberglass. A letter from NAIMA dated June 8, 2011, stated "non-formaldehyde binder products represent the vast majority of the industry" and "all major sources have already converted or have announced plans to convert to non-phenol formaldehyde binders." Based on a review of the current permit status of all sources and recent information provided by industry, 10 facilities are major sources (subject to the existing MACT rule, subpart NNN) and 20 facilities are area source facilities. The 10 facilities operate 8 gas-fired glass-melting furnaces and 13 flame attenuation (FA) manufacturing lines that will have to comply with the RTR amendments to the NESHAP (subpart NNN) requirements. Based on our current emissions data, two of the major source facilities, operating a total of two gas-fired glass-melting furnaces will be required by the final rule to reduce chromium compound emissions.

We estimate that there are currently eight gas-fired furnaces located at five facilities designated as major sources. We also estimate that there are currently three gas-fired furnaces located at two facilities that emit chromium compounds above the final chromium emission limit. We have estimated the cost impact for those facilities based on the assumption that those furnaces will have a shortened operational life cycle and be rebuilt (or replaced) earlier than they might have been otherwise. The associated costing of this scenario is referred to as

the replacement cost approach which is described in the EPA Air Pollution Control Cost Manual (EPA/452/B-02-001), January 2002. Based on comments received in response to the November 13, 2014 supplemental proposal, we changed from using the net present value (NPV) approach to using this replacement cost method for estimating the annualized cost of rebuilding a furnace. An explanation of why EPA changed its approach can be found in the cost memorandum for this final wool fiberglass RTR.[10]

The furnace age and chromium emissions data show that furnaces may operate into their 10th year and still emit chromium at levels below the chromium emission limit. The data also show that all furnaces older than 10 years emitted chromium at levels exceeding the proposed emission limit. We considered basing the cost estimate on an expected 12-year furnace life and an early rebuild at 10 years. While supported by the available data and resulting in a lower cost estimate, we decided to use a more conservative (i.e., more likely to overstate than understate cost estimates) approach and based our costs on an expected 10-year furnace life and an early rebuild at 7 years. This approach is supported by industry comments. The associated costing of this scenario is referred to as the replacement cost approach which is described in the EPA Air Pollution Control Cost Manual (EPA/452/B-02-001), January 2002. More information on the furnace life cycle cost estimation approach can be found in the cost memo for the wool fiberglass RTR. [11] Using this more conservative approach, the total annualized cost per affected furnace is estimated at $426,000.

Industry comments on the proposed major source rule amendments (76 FR 72770) stated that some of the major source facilities have already switched some or most of their RS lines to non-HAP binders and thus would no longer be subject to subpart NNN. With the phase-out of phenol-formaldehyde binders on RS lines, those sources will also be redesignated as area sources. While industry sources also predicted before proposal of the RTR amendments that no major sources would exist by the end of 2012, we now believe this to be inaccurate. According to the most current industry information, at least one RS bonded line that uses a phenol-formaldehyde binder is still operated by each wool fiberglass company. The following cost impacts are based on the estimated 10 facilities that were identified as major sources (i.e.,

[10] Danny Greene, ERG, to Susan Fairchild, US EPA. Estimated Cost Impact for Mineral Wool Production Industry to Comply with Residual Risk and Technology Review (RTR) Amendments. June 18, 2015.

[11] Memo from Danny Greene, ERG, to Susan Fairchild, US EPA. Costs and Emission Reductions for the Final Wool Fiberglass Manufacturing NESHAP - Residual Risk and Technology Review (RTR) Amendments, June 18, 2015.

those operating a bonded line using a phenol-formaldehyde binder) in the most recent industry information provided in December 2012.

As noted previously, several facilities have already switched all or most of their rotary spin (RS) manufacturing lines to non-PF binders. Based on the most recent information provided by industry, two of those facilities also have 13 bonded flame attenuation (FA) lines, all of the FA lines continue to us a phenol/formaldehyde binder, and all of the FA lines are in compliance with the emission limits in the final rule. Therefore, additional controls are not needed for existing FA lines. However, the two facilities will incur additional testing costs to demonstrate compliance with the new emission limits for FA lines.

In sum, the total annualized costs to the industry for this rule are $1.014 million (2013 dollars).

This economic impact analysis identified the businesses that will be affected by this rule and provides an analysis at a screening level to assist in determining whether this rule is likely to impose a significant economic impact on affected businesses. The analysis employed here is a "sales test" that computes the annualized compliance costs as a share of sales for each company. The annualized cost per sales for a company represents the maximum price increase in affected product needed for the company to completely recover the annualized costs imposed by the regulation. This is the same methodology employed for the economic impact analysis for the mineral wool RTR, shown earlier in this report.

The "sales test" is the impact methodology EPA employs in economic impact analysis such as this one as opposed to a "profits test", in which annualized compliance costs are calculated as a share of profits.[12] This is because revenues or sales data are commonly available data for entities normally impacted by EPA regulations and profits data normally made available are often not the true profits earned by firms due to accounting and tax considerations. Firms and entities often have ways legally available in the tax code to minimize their reported profits; thus, using reported profits may lead to a less than accurate estimate of the economic impact of a regulation to an affected firm or entity and their consumers. While screening level analyses are often employed to estimate impacts to small business or entities as part an analysis in compliance with the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), a screening level analysis can also be

[12] More information on sales and profit tests as used in analyses done by U.S. EPA can be found at http://www.epa.gov/sbrefa/documents/rfaguidance11-00-06.pdf, pp. 32-33.

employed in an economic impact analysis such as this one whose focus is on the regulated companies.

As mentioned earlier, wool fiberglass facilities are also included in NAICS (North American Industrial Classification System) 327993 along with mineral wool facilities. There are five parent firms owning these facilities with HAP sources affected by the major source RTR proposal, and these firms are shown in Table 2. None of these firms is a small business as defined by the SBA (750 employees or less for an ultimate parent company, as mentioned earlier for the relevant NAICS code). Each of these firms has revenues in excess of $3 billion in 2013, as shown in Table 2. All of the firms are owned by parent companies based in the U.S. except for CertainTeed, which is owned by Saint-Gobain, a French conglomerate, and Knauf, Inc., which is owned by the Knauf Group, Inc.) , a German conglomerate. Table 2 provides the annualized costs and economic impacts to the affected firms from this major source rule. With Guardian, Inc. and Knauf, Inc. not incurring any costs from this rule, the impacts to these firms from this rule are zero. All estimates of annualized costs are taken from the cost memo for the wool fiberglass RTR. EPA used no CBI in generating economic impacts for this industry.

Table 2: Wool Fiberglass Firms that Are Affected by the Major Source RTR, their Revenues and Costs Incurred from the Major Source RTR, and Economic Impacts from this Major Source RTR

Wool Fiberglass Firm	Annual Revenues in 2013 (billions)	Total Annualized Costs (2013 dollars)[f]	Annualized Costs as a Percentage of Annual Revenues in 2013
Owens Corning	$5.30[a]	$492,000	0.0093
Johns Manville (owned by Berkshire-Hathaway)	$182.15[b]	40,400	0.000022
Certain Teed (owned by Saint-Gobain)	$31.64[c]	482,000	0.0015
Guardian, Inc.	$5.60[d]	0	0
Knauf, Inc. (owned by the Knauf Group)	$4.72[e]	0	0

[a]Taken from http://investor.owenscorning.com/financial-news/financial-news-details/2014/Owens-Corning-Reports-Fourth-Quarter-and-Full-Year-2013-Results/default.aspx.

[b] Taken from the 2013 Berkshire-Hathaway annual report at http://www.berkshirehathaway.com/2013ar/2013ar.pdf, p. 26.

[c] Taken from the 2013 annual report for Saint-Gobain, Inc. http://www.saint-gobain.com/files/DDR_2013_GB.pdf, p. 6. Conversion from euros uses euro to U.S. dollar value as an average for 2013 using estimates from the U.S. Federal Reserve found at http://www.federalreserve.gov/releases/G5a/current/default.htm. The value is 1.3281.

[d] Revenues available at http://www.forbes.com/companies/guardian-industries/.

[e] Taken from https://www.linkedin.com/company/knauf. Conversion from euros uses euro to U.S. dollar value as an average for 2013 using estimates from the U.S. Federal Reserve found at http://www.federalreserve.gov/releases/G5a/current/default.htm. The value is 1.3281.

The economic impact on these wool fiberglass firms as result of the major source RTR rule, measured in annual compliance costs as a percent of sales or revenues, is less than 0.005 percent for each of the affected parent firms based on using available revenue data for 2013 to be consistent with the year for the cost estimates. The price elasticity of demand for wool

fiberglass is estimated at -0.8[13], and the price elasticity of supply for wool fiberglass is estimated at -0.7.[14] With the responsiveness of wool fiberglass demand and supply at less than 1:1 compared to a price change of 1 percent, and with the change in product price as approximated by the cost to revenue ratio at less than 0.1 percent, for this ratio is the maximum price change that producers may face, it is expected that wool fiberglass price and output changes will be clearly less than 0.1 percent.[15] Hence, the overall economic impact of this rule should be low on the affected industry and its consumers.

Wool Fiberglass Area Source Rule

4.A. Background

Based on the information provided by the wool fiberglass manufacturing industry and their primary trade association, North American Insulation Manufacturers Association (NAIMA), there are currently 30 facilities in the U.S. producing wool fiberglass. A letter from NAIMA dated June 8, 2011, stated "non-formaldehyde binder products represent the vast majority of the industry" and "all major sources have already converted or have announced plans to convert to non-phenol formaldehyde binders." Based on a review of the current permit status of all sources and recent information provided by industry, 10 facilities are major sources (subject to the existing MACT rule, subpart NNN) and 20 facilities are area source facilities. These 30 facilities operate a total of 54 glass-melting furnaces. Five of the area source facilities operate eight furnaces which meet the applicability requirements in the proposed area source NESHAP (subpart NN). Based on our current emissions data, none of these furnaces will be required by the rule to reduce chromium compound emissions.

Industry comments on the proposed major source rule amendments (76 FR 72770) stated that some of the major source facilities have already switched some or most of their lines to non-HAP binders and would no longer be subject to subpart NNN. With the phase-out of phenol-formaldehyde binders, these sources will also be redesignated as area sources. While

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[13] Ho, M. S, R. Morgenstern, and J. S. Shih. 2008. "Impact of Carbon Price Policies on US Industry." RFF Discussion Paper 08-37. http://www.rff.org/Publications/Pages/Pulbicationdetails.aspx publicationid=20680. Accessed August 2009. Table 8.A.6.

[14] Broda, C., N. Limao, and D. Weinstein. 2008b. "Export Supply Elasticities." http://faculty.chicagobooth.edu/christian.broda/website/research/unrestricted/TradeElasticities/TradeElasticities.html.

[15] This conclusion is consistent with the existence of perfect competition for this industry. This conclusion may change somewhat to the extent that this industry is imperfectly competitive.

industry sources also predicted before proposal of the RTR amendments to NNN that no major sources would exist by the end of 2012, we now believe this to be inaccurate. Table 2 of the wool fiberglass area source cost memo provides further information on wool fiberglass furnaces by furnace type and whether furnaces would currently be subject to the area source rule under subpart NN. The following cost impacts are based on the estimated five facilities and eight gas-fired glass-melting furnaces that would be subject to the area source rule requirements.

4.B. Economic Impact Estimates

We estimate that there are currently eight gas-fired furnaces located at five facilities designated as area sources. We also estimate that none of the gas-fired furnaces located at area source facilities emit chromium compounds above the final chromium emission limit (2.5E-04 lb/ton of glass pulled). Therefore, none of the gas-fired glass-melting furnaces at area sources must be rebuilt to comply with subpart NN. However, the facilities must conduct annual compliance testing for each furnace (annualized cost of $10,000 per furnace for a total annualized cost of $80,000).

Thus, the total annualized cost of the final area source rule is $80,000 (2013 dollars).

We prepared a similar economic impact analysis for the wool fiberglass area source final rule as that for the final RTR shown earlier in this report. As mentioned earlier, wool fiberglass facilities are also included in NAICS (North American Industrial Classification System) 327993 along with mineral wool facilities. There are three parent firms owning these facilities with HAP sources affected by the area source rule, and these firms are shown in Table 3. None of these firms is a small business as defined by the SBA (750 employees or less for an ultimate parent company, as mentioned earlier for the relevant NAICS code). Each of these firms has revenues in excess of $3 billion in 2013, as shown in Table 3. These firms are owned by parent companies based in the U.S. except for CertainTeed, which is owned by Saint-Gobain, a French conglomerate, and Knauf, Inc., which is owned by the Knauf Group, a German conglomerate. Table 3 provides the annualized costs and economic impacts to the affected firms from this area source rule. All estimates of annualized costs are taken from the cost memo for the wool fiberglass area source final rule. EPA used no CBI in generating economic impacts for this industry. It should be noted that Guardian, Inc. and Johns Manville do not have area sources that are subject to this rule. Thus, the cost to each of these firms as a result of this area source NESHAP is zero.

Table 3: Wool Fiberglass Firms that Are Affected by the Area Source Rule, their Revenues and Costs Incurred from the Area Source Rule, and Economic Impacts from this Area Source Rule

Wool Fiberglass Firm	Annual Revenues in 2013 (billions)	Total Annualized Costs (2013 dollars)	Annualized Costs as a Percentage of Annual Revenues in 2013
Owens Corning	$5.30[a]	$40,000	0.0007
Certain Teed (owned by Saint-Gobain)	$31.64[b]	$20,000	0.00006
Knauf, Inc. (owned by The Knauf Group)	$4.72[c]	$20,000	0.0094

[a] Taken from http://investor.owenscorning.com/financial-news/financial-news-details/2014/Owens-Corning-Reports-Fourth-Quarter-and-Full-Year-2013-Results/default.aspx.

[b] Taken from 2013 annual report for Saint-Gobain, Inc. http://www.saint-gobain.com/files/DDR_2013_GB.pdf, p. 6. Conversion from euros uses euro to U.S. dollar value as an average for 2013 using estimates from the U.S. Federal Reserve found at http://www.federalreserve.gov/releases/G5a/current/default.htm. The value is 1.3281.

[c] Taken from https://www.linkedin.com/company/knauf. Conversion from euros uses euro to U.S. dollar value as an average for 2013 using estimates from the U.S. Federal Reserve found at http://www.federalreserve.gov/releases/G5a/current/default.htm. The value is 1.3281.

The economic impact on these wool fiberglass firms as result of the area source rule, measured in annual compliance costs as a percent of sales or revenues, is less than 0.01 percent for each of the affected parent firms based on using available revenue data for 2013 to be consistent with the year for the cost estimates. The price elasticity of demand for wool fiberglass is estimated at -0.8[16], and the price elasticity of supply for wool fiberglass is

[16] Ho, M. S, R. Morgenstern, and J. S. Shih. 2008. "Impact of Carbon Price Policies on US Industry." RFF Discussion Paper 08-37. http://www.rff.org/Publications/Pages/Pulbicationdetails.aspx publicationid=20680. Accessed August 2009. Table 8.A.6.

estimated at -0.7.[17] With the responsiveness of wool fiberglass demand and supply at less than 1:1 compared to a price change of 1 percent, and with the change in product price as approximated by the cost to revenue ratio at less than 0.1 percent, for this ratio is the maximum price change that producers may face, it is expected that wool fiberglass price and output changes will be less than 0.1 percent.[18] Hence, the overall economic impact of this rule should be low on the affected industry and its consumers.

4. Conclusion – Summary of Cumulative Impacts Across Rules

The total annualized costs of the RTR and area source rules for the mineral wool and wool fiberglass manufacturing categories combined are $1,143,200 (2013 dollars), with $1,094,400 incurred by the wool fiberglass industry. For more information on the annualized compliance costs (i.e., the costs of control + the costs of monitoring, testing, and other administrative costs), please refer to the cost memos for this rule for these industries. We also see that no firm is expected to experience an impact of more than 0.010 percent of annualized costs as a percent of sales from the cumulative costs of these rules. Guardian, Inc. is not expected to incur costs from either the wool fiberglass RTR or the wool fiberglass area source rule.

For the rules, we find individually that we can certify that there is not a significant impact on a substantial number of small entities (or SISNOSE). This is based on no small firm being significantly impacted by this rule as shown in the impact results presented in this economic impact and small business impact analysis. We include all small firms affected by this rule in the determination of this conclusion. Of the eleven firms affected by these three rules, five mineral wool companies are small firms, and none of the small firms is affected significantly. All of these small firms are mineral wool manufacturers; no wool fiberglass manufacturer is a small business. Since the major and area source rules for wool fiberglass manufacturing do not impact small businesses, the Agency can provide a certification of no SISNOSE for the entire rulemaking in today's action.

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[17] Broda, C., N. Limao, and D. Weinstein. 2008b. "Export Supply Elasticities." http://faculty.chicagobooth.edu/christian.broda/website/research/unrestricted/TradeElasticities/TradeElasticities.html.

[18] This conclusion is consistent with the existence of perfect competition for this industry. This conclusion may change somewhat to the extent that this industry is imperfectly competitive.

Although these rules would not have a significant economic impact on a substantial number of small entities, the EPA nonetheless has tried to reduce the impact that these rules would have on small entities. The actions we are taking to reduce impacts on small businesses include less frequent compliance testing for the entire mineral wool industry and subcategorizing the Mineral Wool Production Source Category in developing the COS, HF and HCl emissions limits.

Finally, the small changes in price and output expected as a rule of any one or all three of these rules, and the minimal additional labor that will be required as a result of the compliance requirements, both from controls and monitoring, recordkeeping, reporting, and testing, suggests that net employment impacts (that is, all employment impacts of any kind) resulting from this final rulemaking will be negligible.