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CONSTRUCTION MATERIALS

ANALYSIS OF POTENTIAL VALUE CHAINS

FINAL

Sunday, September 04, 2011

This publication was produced for review by the United States Agency for International Development. It was prepared by Deloitte Consulting LLP.

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USAID ECONOMIC PROSPERITY INITIATIVE (EPI)

CONTRACT NUMBER: AID-114-C-10-00004

DELOITTE CONSULTING LLP

USAID/CAUCASUS

SUNDAY, SEPTEMBER 04, 2011

DATA

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Name of Component: Non-Agricultural Sectors

Practice Area: Construction Materials

Key Words: Georgia, construction materials, glass, electric cables, gypsum, locks, doors, windows, iron, steel, HVAC, insulated cables, paint, cement, aluminum, plastic, mountings,

ABSTRACT

This document, prepared by Turkish consultant, Selen Poyraz, briefly analyzes Georgia's potential to manufacturer a small range of construction materials based on a range of factors. These include local growth potential, contribution to narrowing the trade deficit, ease of entry into the industry, production intensity, availability of inputs, technology needs and regional competition.

Rather than indicate specific construction materials Georgia has the potential to excel at, it does give a prioritization with which construction materials could be studied in greater detail.

ABBREVIATIONS

ABS	Acrylonitrile Butadiene Styrene
GTIP	Gumruk Tarife İstatistik Pozisyonu
HVAC	Heating, ventilation and air-conditioning
ITC	International Trade Centre
MDF	Medium Density Fiberboard
PE	Polyethylene
PPRC	Polypropylene Random Co-polymer
PVC	Polyvinylchloride
R&D	Research and Development
RFID	Radio Frequency Identification
U.S.	United States of America
USD	United States Dollar

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I. EXECUTIVE SUMMARY

The construction materials industry has a number of sub-sectors that have different dynamics and which require different capabilities and resources. The trade data for several construction material sub-industries for Georgia was assessed to identify any additional potential industries.

Apart from timber, clay-based construction materials (ceramic tile, ceramic sanitary wear, brick and tile) and basalt (stone wool), Georgia has trade deficits in all sub-categories consistently (except for cement - Georgia has a deficit in cement only in year 2010).

Based on analysis of the trade data for countries near to Georgia:

- Armenia has trade deficits in all categories except for cement;
- Ukraine has trade deficit in all categories except iron & steel, timber, ceramic sanitary ware, wallpaper and cement
- Azerbaijan has trade deficit in all categories except for gypsum
- Turkey is in a net exporter position in all categories except for timber, electric materials, HVAC, paint, insulation materials, wallpapers, lighting, glass, locks & mountings.

TRADE DATA ANALYSIS FOR GEORGIAN CONSTRUCTION MATERIALS INDUSTRIES

Development of Construction Materials Trade in Georgia							
Construction materials (US thousands)	Balance in value in 2006	Balance in value in 2007	Balance in value in 2008	Balance in value in 2009	Balance in value in 2010	Exported value in 2010	Imported value in 2010
Iron and Steel	- 92.815	- 191.881	- 216.005	- 94.902	- 146.494	39.404	185.898
Plastic Construction Materials	- 24.951	- 36.065	- 42.896	- 29.975	- 44.471	109	44.580
Timber	- 4.602	- 26.192	- 49.229	- 29.908	- 42.293	7.602	49.895
Ceramic Tiles	- 19.660	- 26.954	- 39.032	- 24.339	- 33.304	287	33.591
HVAC	- 20.185	- 33.192	- 43.164	- 23.009	- 32.142	809	32.951
Lighting	- 16.668	- 25.650	- 21.868	- 19.525	- 23.714	136	23.850
Cables	- 2.117	- 9.577	- 10.502	- 5.258	- 19.949	845	20.794
Paint	- 16.302	- 18.090	- 21.015	- 15.082	- 18.286	84	18.370
Cement	12.008	33.041	22.636	- 1.155	- 15.861	5.543	21.404
Aluminum Construction Materials	- 12.384	- 14.217	- 19.928	- 10.992	- 13.898	64	13.962
Locks, mountings, etc.	- 7.402	- 12.316	- 16.310	- 11.522	- 13.600	40	13.640
Electric Materials	- 6.947	- 10.386	- 17.969	- 8.584	- 12.716	175	12.891
Gypsum	- 3.551	- 5.015	- 6.354	- 4.884	- 12.223	310	12.533
Glass Construction Materials	- 11.269	- 11.538	- 16.653	- 11.016	- 11.328	39	11.367
Natural Stones	- 5.685	- 5.028	- 5.416	- 6.190	- 8.189	52	8.241
Wallpapers	- 5.042	- 6.365	- 9.422	- 6.930	- 8.055	1	8.056
Ceramic Sanitaryware	- 4.279	- 6.374	- 8.141	- 5.072	- 7.323	1	7.324
Prefabric	- 1.343	- 3.791	- 6.664	- 3.058	- 3.232	53	3.285
Glass Wool	- 825	- 1.906	- 2.368	- 2.477	- 1.580	62	1.642
Mineral Wool	- 1.521	- 887	- 1.129	- 978	- 1.022	-	1.022
Brick and Tile	- 327	- 1.324	- 1.008	- 249	- 592	13	605

Source: ITC Trademap. The following GTIP codes were included- iron and steel (7214, 7215, 7216, 7217, 7303, 7304, 7305, 7306, 7307, 7308, 7317, 7318, 7322), plastic construction materials (3917, 3918, 3925), timber construction products (4401, 4403, 4404, 4406, 4407, 4408, 4409, 4410, 4411, 4412, 4413, 4418), ceramic tiles (6907, 6908), HVAC (8402, 8403, 8404, 8415, 841911, 841919, 851610, 851621), lighting (9405), cables (854442, 854449), paint (3208, 3209, 3210), cement (2523), aluminum construction materials (7604, 7610), locks, mountings, etc. (8301, 8302), electric materials (8536), gypsum (2520), glass construction materials (flat glass) (7003, 7004, 7005, 7008, 7016), natural stones (6802, 6803), wallpapers (4814), ceramic sanitary ware (6910), pre-fabric (9406), glass wool (7019), stone wool (6806), brick and tile (6904, 6905)

SUMMARY OF FINDINGS

Insulated cables, plastic construction materials, gypsum and metal mountings/fittings (furniture accessories could be focused on depending on the growth of the furniture industry as it supplies inputs to furniture companies) could be industries with possible growth potential in Georgia in addition to timber, perlite and basalt and could be analyzed in further value chain assessments.

The growth in insulated cables, plastic construction materials (i.e. window/door profiles, plastic pipes) and gypsum in Georgia can very much be triggered by new construction and renovation projects that are expected in the local and to some extent regional market. Thus, the attractiveness of these sub-industries also depends on domestic market growth potential.

Insulated cables are raw material intensive but local copper could be used in production. Plastic construction materials, on the other hand, are also raw material intensive and the raw materials will mostly be imported as they are based on petrochemicals. However, this industry does not require significant upfront investment and will also create employment opportunities by creating an installation and assembly sector together with it (i.e. plastic window/door profiles installation and assembly) (although labor is minimal during production).

Gypsum mainly uses local materials and does not require significant investment. Metal mountings and fittings for furniture accessories could be focused upon if the furniture industry grows in Georgia.

Apart from these, if Georgia can have competitive energy costs (natural gas) as well as invest in development of local labor skills, then the ceramic tiles[1]/ceramic sanitary ware industries could be good to focus on as most of the materials can be procured locally and would create employment opportunities (labor represents a critical percentage in production). However, these industries should be focused on mostly for the local market due to difficulty in competing regionally, as there is excess capacity and strong players in the region.

[1] Ceramic tile consumption or production can also trigger growth of construction chemicals industry in Georgia such as ceramic adhesives, insulation material adhesives, tile grouts, etc.

II. APPENDICES

A. ANALYSIS OF POTENTIAL VALUE CHAINS

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IRON AND STEEL PRODUCTS

This industry is raw material and energy intensive and the raw material required does not exist in Georgia. The labor costs only represent 10-15% of the production costs.

Furthermore, it requires high upfront investment (i.e. 2 billion USD for a 3-4 million ton production capacity[2]) and there are significant players in the nearby geography such as Russia, Ukraine and Turkey, etc. in production of crude steel that would make it difficult to compete.

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

This sub-industry includes products such as boilers, air conditioning equipment, etc. The industry is raw material/input intensive as certain components (i.e. fans) are procured from certain global players. Energy does not represent a significant share in production costs especially when compared to industries such as cement, ceramic tiles, etc. However, the industry is technology and capital intensive.

This industry is dominated by some global players who also have either partnered or bought certain local players in Turkey. Some of these companies are Vaillant, Baxter, Viessmann, Ferroli and Diakin.

INSULATED CABLES

There are various types of cables such as energy and telecommunication cables. Energy cables are further classified under three segments - low voltage, medium voltage and high voltage cables, and telecommunications cables are classified as fiber optic and copper cables. There is a transition to fiber optic cables in telecommunications. Low voltage cables are those that are used in mainly buildings.

Cable manufacturing is a raw material intensive industry with raw materials representing 65-85% of the cost of cable production depending on the material used. The electricity, labor, amortization altogether represent less than 20% of production costs. The main raw materials are copper or aluminum as well as the plastic materials for the coating. In some countries, aluminum is used in cables instead of copper in city networks. For the outer coating plastics based materials are used depending on the cable type such as PVC, PE, etc. Georgia has availability of copper as natural resource and this may create an advantage against countries that are dependent on copper imports (due to currency fluctuations, logistics, etc.).

[2] Turkey Association of Iron and Steel Industry interview

On the other hand, plastic-based materials may need to be imported by Georgia as these are petrochemicals and Georgia is dependent on petroleum products on imports.

Most European cable manufacturers have closed their facilities as the demand for cables in Europe began declining with slowed growth in new infrastructure and building constructions. Currently, they source their cable needs by imports as it is only for maintenance or limited new construction purposes.

As Turkey was developing and new building and infrastructural constructions were increasing, many cable manufacturing companies invested in used machinery and equipment sold by European manufacturers. Currently there is excess capacity in the country compared to demand in Turkey.

For cables it is indicated that having local demand is critical if one wants to invest in cables. Since Georgia has domestic demand for cables i.e. energy and telecommunication networks, then it may be more viable in investing in cable manufacturing. In the nearby markets, Turkey and Ukraine do not have trade deficits and Georgia and nearby countries import cable products mainly from Turkey, Ukraine, Germany and China.

Insulation Cable/Wire Trade Development (GTIP 8544)

Cable Trade (USD thousands)	Balance in value in 2006	Balance in value in 2007	Balance in value in 2008	Balance in value in 2009	Exported value in 2009	Imported value in 2009	Top Countries Imported From
Turkey	726.810	1.169.482	1.508.159	955.220	1.805.509	543.208	China, Germany, Italy, Romania, Bulgaria
Ukraine	116.425	219.322	222.541	342.802	579.813	237.011	Poland, Germany, Austria, Hungary, Czech
Georgia	-27.837	-45.094	-42.895	-21.977	1.042	33.380	Turkey, Ukraine, Russia, Czech, Belarus, China
Armenia	-13.717	-15.240	-33.072	-23.146	17	23.163	Turkey, Russia, Finland, Germany, Korea
Azerbaijan	-47.316	-40.891	-48.239	-40.606	1.484	42.090	Turkey, Russia, China, Belarus, Germany
Russia	-205.409	-318.231	-593.240	-328.580	254.025	582.605	China, Germany, Finland, Ukraine, Turkey

Source: ITC Trademap

The trade deficit in insulated cables/wires in Armenia and Azerbaijan equals approximately USD 63 million. Based on the trade data, there seems to be local demand for cables in Georgia as well, however, further analysis should be conducted to identify the domestic market need and investment requirements in cables.

PAINT

Georgia exports a minimal amount of decorative paint and has been consistently at a trade deficit position in the past few years. Although there is an opportunity for import substitution in finished goods, the paint industry is highly raw material-intensive. Some of the raw materials are petrochemicals, so Georgia may depend on imports on these raw materials (as is the case in Turkey).

The highest share in the production cost of the paint is the raw materials. The share of labor and energy is very limited, diminishing Georgia's competitiveness in the industry.

Production Costs Breakdown	Paint
Raw materials / materials	80-90%
Labor	5%
Energy	2%
Amortisation	3%
Services received	2%
Other	1%

Source: Company interviews

Decorative paint requires the following materials for production:

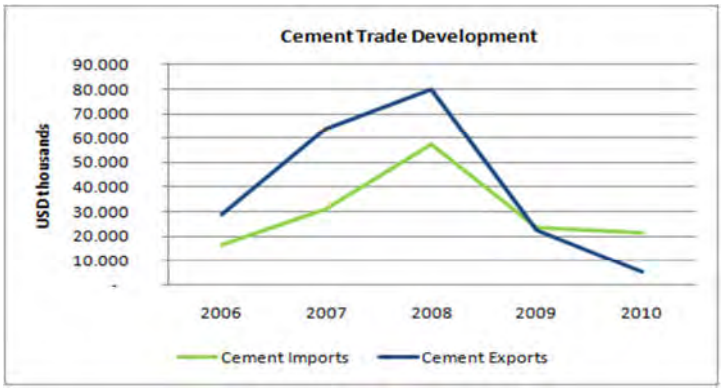
- Pigments contribute in color
- Binders bind the pigments together, and strongly influence such properties as gloss potential, exterior durability, flexibility, and toughness.
- Solvents' whose main purposes are to adjust the curing properties and viscosity of the paint. Solvents are optional. Water is the main diluent for water-borne paints.
- Besides the three main categories of ingredients, there may be some additives as well.[3]

Almost all raw materials are petrochemicals and are usually imported from developed countries such as Germany and the USA. Apart from these countries, some materials are also procured from Ukraine, China, Saudi Arabia, etc. by Turkish paint manufacturers.

As the proportion of labor in production is small, the raw materials represent a high percentage and dependence on imported raw materials would make focusing on paint production not feasible for Georgia.

CEMENT

Cement is energy intensive industry which requires a high upfront investment. Currently, there is a global player in Georgia – Heidelberg Cement. Up until 2010, Georgia was in a net exporter position in cement although in 2010 exports dropped significantly.



Source: ITC Trademap

[3] Wikipedia

Although the industry is sensitive to logistics costs, Iran and Turkey have large production capacities in the region and may take advantage of the regional need. Also as Heidelberg is already an investor in the country, they may think of expanding their capacity if an additional need arises.

ALUMINUM CONSTRUCTION MATERIALS

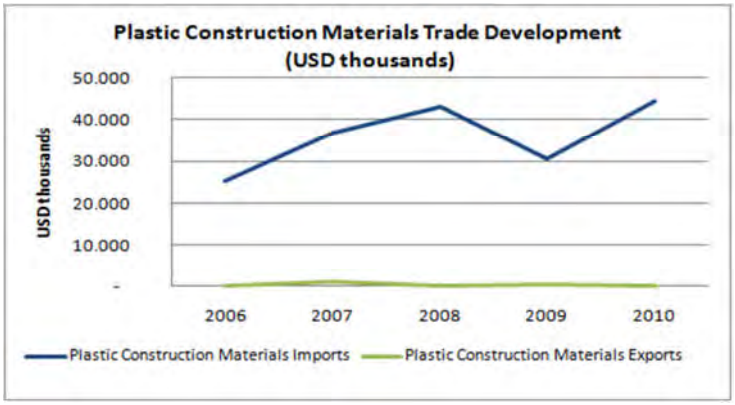
Aluminum products provide input for multiple industries such as construction, automotive, white goods, etc.

This industry is raw material (crude or recycled) and energy intensive and the raw materials do not exist in Georgia.

Depending on the type of manufacturing facility, large-scale facilities mostly use more advanced technology and require higher investment. However, there are also smaller-scale facilities which use older technology and have mostly labor-intensive production.

PLASTIC CONSTRUCTION MATERIALS

Georgia currently has three manufacturers of plastic construction materials producing doors/window frames, parquetry, panels and pipes with around 1,000 employees. However, the country is in a net importer position for the past few years with USD 30.4 million imports in 2009.



Source: ITC Trademap

The use of plastics in construction is increasing as a result of their characteristics; ease of application, low maintenance requirements, no corrosion and cost advantages. Plastics have diverse applications in various construction materials some of which are:

- Window/door plastic profiles
- Pipes (including clean water, sewage, electricity cable tray and fittings)
- Roof covering materials
- Floor tiles
- Decorative ceiling covering materials
- Hoses, sheets, electrical parts

- Cable, socket and connecting parts
- Plastic panels for walls
- Kitchen and bathroom sinks

Plastic construction materials such as plastic window/door profiles and plastic pipe sub-sectors may be potential sectors to focus on for Georgia as the entry barriers are lower in terms of upfront investment.

MARKET POTENTIAL

When export potential into surrounding countries is considered (including import substitution of plastic construction materials in Georgia itself), the market size for plastic construction materials is estimated at around USD 172 million.

Among these plastic construction materials, the size of the plastic tubes/pipes and fittings sub-sector is much higher compared to floor/wall/ceiling coverings and plastic builders' ware (which mainly includes plastic window and door profiles). The surrounding countries mainly import plastic goods from countries such as Turkey, China, France, Italy, and Russia. If Georgia develops the necessary infrastructure for the manufacturing of these materials, the country could take a share in the trade of these goods.

Plastic Construction Materials (thousand USD)	Imports (2009)	Trade Balance (2009)	Top Importing Countries
Georgia	**30.456.000**	**-29.975.000**	**Turkey, China, Czech, Ukraine, Germany**
Tubes, pipes, fittings and hoses thereafter plastics (GTİP 3917)	20.680.000	-20.227.000	
Floor, wall, ceiling coverings in rolls or tiles of plastic (GTİP 3918)	4.915.000	-4.915.000	
Builders ware of plastics (GTİP 3925)	4.861.000	-4.833.000	
Armenia	**12.881.000**	**-12.093.000**	**Turkey, China, Iran, Italy**
Tubes, pipes, fittings and hoses thereafter plastics (GTİP 3917)	8.619.000	-7.911.000	
Floor, wall, ceiling coverings in rolls or tiles of plastic (GTİP 3918)	1.072.000	-1.072.000	
Builders ware of plastics (GTİP 3925)	3.190.000	-3.110.000	
Azerbaijan	**14.531.000**	**-12.577.000**	**Turkey, France, China, Russia, UK**
Tubes, pipes, fittings and hoses thereafter plastics (GTİP 3917)	8.508.000	-6.571.000	
Floor, wall, ceiling coverings in rolls or tiles of plastic (GTİP 3918)	556.000	-551.000	
Builders ware of plastics (GTİP 3925)	5.467.000	-5.455.000	
Ukraine	**189.349.000**	**-117.471.000**	**Poland, Germany, Russia, China, Czech**
Tubes, pipes, fittings and hoses thereafter plastics (GTİP 3917)	113.783.000	-68.976.000	
Floor, wall, ceiling coverings in rolls or tiles of plastic (GTİP 3918)	25.221.000	-15.435.000	
Builders ware of plastics (GTİP 3925)	50.345.000	-33.060.000	
TOTAL	**247.217.000**	**-172.116.000**	

Source: ITC Trademap

If Georgia's current piping infrastructure is made of metal pipes (iron-steel, copper and aluminum) then there may be a need for renovation, and this would increase the size of local demand.

However, the industry is raw material-intensive. Energy represents approximately 5% and labor represents 7-8% of production costs.

RAW MATERIALS

The main raw materials required for plastic pipes are petrochemical-based inputs such as powder or granules of polyvinylchloride (PVC), polyethylene (PE) and polypropylene random co-polymer (PPRC).

As for the plastic profiles for windows/doors, polyvinylchloride (PVC) is used mostly.

These plastic materials are petrochemicals and may need to be imported into Georgia, so although there is a potential for substituting finished goods, the industry may still be importing some of the raw materials.

INVESTMENT REQUIREMENTS

For the production of plastic pipes, extruders are used while the plastic fittings are manufactured with the use of injection machinery. The main machinery for the production of plastic profiles is extruders. The industry does not require significant upfront investment. According to discussions with extruder manufacturers, the cost of establishing a plant (only machinery and equipment) with a medium to small capacity (7,000 – 10,000 tons) for production of plastic profiles or pipes requires approximately USD 3 – 4 million.[4]

Although the industry is not a labor-intensive industry and may not create significant employment opportunities in production, it could create employment opportunities in assembly and mounting of the plastic materials (PVC doors/windows and pipes) in buildings. For instance, as windows and doors need to be customized for each building, the manufacturing of windows/doors made of profiles is done separately by installation teams (mainly the sales channels).

There is a growing demand for plastic windows/doors globally as a result of the benefits they provide i.e. insulation. As there is an interest to renovate current building stock (because most buildings use wooden doors/windows), there may be significant domestic market potential.

[4] These are approximate figures and the type of products produced can be limited due to limited number of production lines (4-5) as each production line can only allow manufacturing of pipes with certain dimensions.

Large scale plastic profile manufacturers have 50-70,000 ton/year capacity in Turkey.

LOCKS, MOUNTINGS, ETC.

Locks are raw material-intensive, made from metal-based raw materials such as brass, chrome, nickel, zinc alloys among the top inputs. The production process consists of presses and machining and assembly. Assembly is more labor intensive.

The lock industry globally is transforming from use of mechanical locks (i.e. door locks, cylinder locks) to more electromechanical and electronic locks such as identification technology, smart cards, RFID readers, automatic doors, etc. and companies are investing in R&D. However, mechanical locks are still being used and this transition may require longer time for developing countries.

Mountings and fittings are also raw material-intensive, using metals such as sheet metals, galvanized sheet metals, steel, wires, etc.

For instance, the raw materials represent 65% of production costs in the furniture accessories industry (these figures may be different for building fittings i.e. door hinges, locks, etc.). Labor still represents 15-20% of the production process, where Georgia may have an advantage due to lower labor costs. If investment was made in Georgia's timber industry, especially in engineered woods such as particle and fiber boards (i.e. MDF), then Georgia may also need to focus on development of the furniture fittings industry.

Furniture Fittings (Hinges, tracks, etc.)	%
Raw Materials	65%
Labor	15-20%
Energy	5%
Amortisation	4%
Other	9%

Source: Company interviews

ELECTRICAL MATERIALS

The electrical materials sub-sector includes products such as fuses, plugs, sockets, interrupters/circuit breakers, fuse boxes, etc.

This industry is raw material-intensive and requires sheet metals i.e. steel/iron and brass; galvanized sheet metals; metals for connecting parts made of brass, copper and silver, as well as plastic materials such as ABS polymer grains (acrylonitrile butadiene styrene) (lightweight materials with the ability to be injection-molded and extruded) and poly carbonates. As plastics are petrochemical-based, Georgia may have difficulty in sourcing these materials domestically and may be dependent on imports.

As for the metal raw materials, copper exists in Georgia, but again there may be difficulty in sourcing other metals such as steel, brass, etc. However, more detailed analysis needs to be conducted to identify the shares of these different metals in the production costs of the products.

The production of electrical materials uses a significant amount of electricity as the production is based on injection molding. Georgia has competitive electricity prices so may have an advantage in production of these products.

Electric Materials Trade (USD thousands)	Balance in value in 2006	Balance in value in 2007	Balance in value in 2008	Balance in value in 2009	Exported value in 2009	Imported value in 2009	Top Countries Imported From
Turkey	-338.351	-381.790	-452.639	-342.384	329.978	672.362	Germany, China, France, Italy, US
Ukraine	-96.392	-140.047	-165.623	-117.690	61.076	178.766	Germany, Austria, Russia, China, Czech
Georgia	-6.947	-10.386	-17.969	-8.584	244	8.828	Turkey, Czech, China, Ukraine, Germany
Armenia	-346	-156	-5.748	-1.584	1.547	3.134	China, Turkey, Italy, Russia, Germany
Azerbaijan	-12.380	-18.425	-13.954	-11.366	11	11.377	Turkey, UK, France, Germany, Austria
Russia	-273.925	-432.126	-589.359	-337.957	130.710	468.667	Germany, France, China, Italy, Ukraine

Source: ITC Trademap

GYPSUM

5% of total gypsum consumption is in agriculture, 15% in industry and the remainder in construction. Gypsum has a wide range of uses in construction: plasters, wall panels and blocks, plaster mold ornaments, etc.

In developed countries, gypsum has a wide use in buildings as partition walls, plasters, etc. due to many benefits it provides - it is lightweight, does not cause environmental pollution, is easy to maintain, easy to apply, etc.

Gypsum is a calcium sulfate-based mineral and can be produced in two ways - naturally or synthetically. Naturally, gypsum is found in nature as gypsose, anhydride, etc. Synthetically, gypsum is produced by desulphurization units of thermal power plants' or fertilizer plants' chimney gases.

Although the main raw material is naturally found and is also available in Georgia, there are some other materials required i.e. cardboard/paper to produce gypsum panels or other chemicals. In Turkey, 80% of perlite production is also used in the gypsum industry. Georgia also has rich perlite reserves that could be used in gypsum production.

The production of gypsum products does not require high investment or sophisticated technologies.[5]

The world's top gypsum producers are the U.S., China, Canada, Iran and Thailand. Iran is located in the region and supplies gypsum products to the region. Azerbaijan and Turkey are also net exporters. Georgia's deficit has increased significantly from USD 4.8 million in 2009 to USD 12 million in 2010. If awareness on gypsum products and their benefits can be improved in the country, then consumption levels may increase. However, this may also be

[5] Turkish Gypsum Manufacturers' Association web site

an industry to focus on the domestic market due to countries with high gypsum production capacities.

Gypsum Trade (USD thousands)	Balance in value in 2006	Balance in value in 2007	Balance in value in 2008	Balance in value in 2009	Exported value in 2009	Imported value in 2009	Top Countries Imported From
Turkey	49.664	61.516	78.821	62.754	67.351	4.597	Greece, Cyprus, Germany, UK
Ukraine	- 28.443	- 28.073	- 15.406	3.469	4.379	910	Turkey, Germany
Azerbaijan	- 284	472	810	223	676	453	Turkey, Iran
Armenia	- 587	- 1.651	- 2.175	- 2.584	3	2.587	Iran, China, Turkey
Georgia	- 3.551	- 5.015	- 6.354	- 4.884	23	4.907	Azerbaijan, Turkey, Ukraine
Russia	- 12.853	- 24.575	- 50.920	- 12.295	1.934	14.229	Turkey, Germany, Poland, Ukraine, US

Source: ITC Trademap

Furthermore, although gypsum production may not create significant employment opportunities, it does create employment opportunities during the application of gypsum-based products including decoration, plasters, plaster boards, etc. For instance, in Turkey, although only approximately 1,500 people are employed in gypsum production, it is indicated that this number increases to 90,000 people when workers in installation and applications of the gypsum materials are taken into account.

GLASS CONSTRUCTION MATERIALS

The raw materials for glass are similar to ceramic tiles. The key inputs are sand, limestone, feldspar, dolomite, sodium and sodium sulfate.

This sub-sector is highly energy-intensive (natural gas, fuel oil or electricity); energy representing almost 30% of the production cost. Labor is still significant with a 20% share.

Production Cost Break-down

Cost Breakdown	Glass Materials (Flat)
Raw Materials	36,4
Energy	28,3
Labor	21,6
Amortisation	10,2
Other	3,32
Total	100

Source: Turkish State Planning Organization

Entry barriers are high due to investment requirements and ongoing global consolidation. Economies of scale are a critical factor in order to be able to compete in the industry. However, some smaller players can succeed by focusing on niche segments.

Global Flat Glass Manufacturers

		# of Employment thousand People	Capacity in thousand tons	Revenue in Million USD
Asahi	3 continents	38	6.250	7.064
Pilkington	5 continents	27,5	4.660	4.970
Guardian	4 continents	25	4.000	3.200
Saint Gobain	5 continents	23	3.860	5.458
Luoyang Co.	China	9,5	1.725	620
PPG	US	10	1.610	2.200
NSG	Japan	8,5	1.135	2.337
Taiwan Glass	Taiwan	8	1.040	400
Trakya Cam	Turkey	4	870	384
Visteon	ABD	4	660	563
Vitro	2 countries	3,5	645	1.094
Other		158	20.224	15.373

Source: Turkish State Planning Organization

Construction Materials Sub-Industry Attractiveness/Potential Matrix for Georgia

Sub-Industry	Potential for Georgia	Local Growth Potential	Contribution to Trade Deficit (2010)	Ease of Entry (size, investment requirements, etc.)	Production Intensity	Availability of Local Inputs for Production	Technology Intensive	Degree of Regional Competition
Iron & Steel	Low	Low	Very High	Difficult	Raw Material and Energy	No	Mid-low	High (Russia, Turkey, Ukraine)
Plastic Construction Materials	Medium to High	High	High	Mid to low	Raw Material	No	Mid-low	
Timber Products	High	High	High	Medium	Raw Material	Yes (critical materials)	Low	
Ceramic Tiles	Medium	Medium	High	Medium	Raw Material, Energy, Labor	Yes (critical materials)	Mid-low	High (Iran, Turkey)
HVAC	Low	Medium	High	Difficult	Raw Material	No	High	
Insulated Cables	Medium to High	Medium	High	Medium	Raw Material	Yes (critical materials)	Mid-low	High (Turkey, CIS region)
Decorative Paint	Low	Medium	High	Mid to low	Raw Material	No	Mid-low	
Cement	Low	Low	High	Difficult	Energy	Yes	Mid-high	High (Turkey)
Aluminum Construction Materials	Low	Low	Medium	Difficult	Raw Material and Energy	No	Mid-low	
Locks (mechanical), mountings, etc.	Medium	Low	Medium	Medium	Raw Material	No	Mid-low	
Electric Materials	Medium to Low	Low	Medium	Medium	Raw Materials	No	Mid-low	
Gypsum	Medium to High	High	Medium	Low		Yes	Low	High (Iran, Russia, Turkey)
Glass Construction Materials	Low	Medium	Medium	High	Raw Material, Energy, Labor	Yes	Mid-low	
Natural Stones	Low	Low	Medium		Energy	No	Low	High (Turkey, Iran)

Ceramic Sanitary Ware	Medium	Medium	Medium	Medium	Raw Material, Labor, Energy	Yes	Mid-low	
Glass Wool	Low	Medium	Low	Medium	Energy	No	Mid-low	
Mineral Wool	High	Medium	Low	Medium	Energy, Labor	Yes	Mid-low	
Brick and Tile	Low	Low	Low	Mid to low	Labor	Yes	Mid-low	

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