

Energy-intensive production: Potential in Georgia

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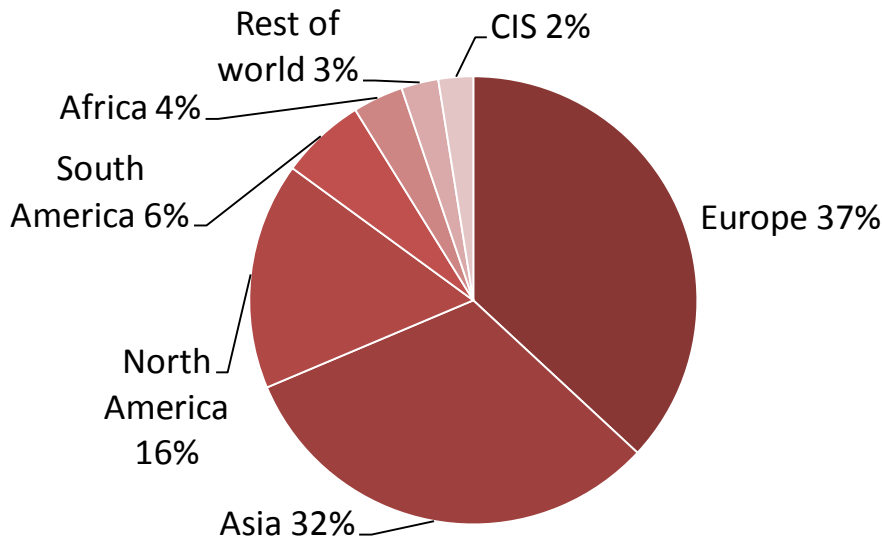
Georgia's potential for producing energy-intensive goods

- We predicted potential for Georgia to specialise in the production of energy-intensive goods (PP/01/2015).
 - Potential was predicted in the following five goods:
 - **Aluminium**: unwrought, bars and rods, foil
 - **Zinc**: Unwrought
 - **Fertilizer** mixtures
 - Aluminium and zinc require a large electricity input in production, fertilizer production can use gas or electricity
 - We proceed in two stages:
 1. Analysis of current situation in Georgia and on the world market
 2. Competitive potential of Georgia for producing these goods
- **Goal: Plausibility check of predicted potential**

1. Current situation in Georgia and on the world market

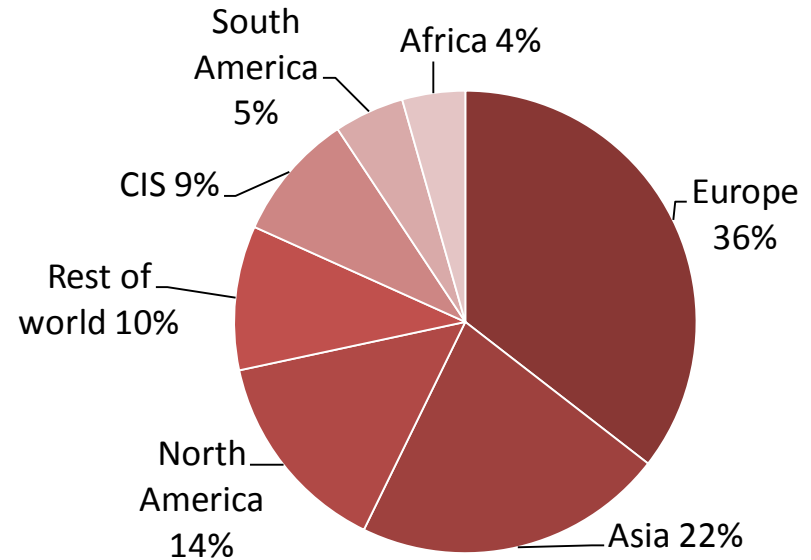
World market for five selected energy-intensive goods

Importers, 2012-2014



Source: UN Comtrade

Exporters, 2012-2014

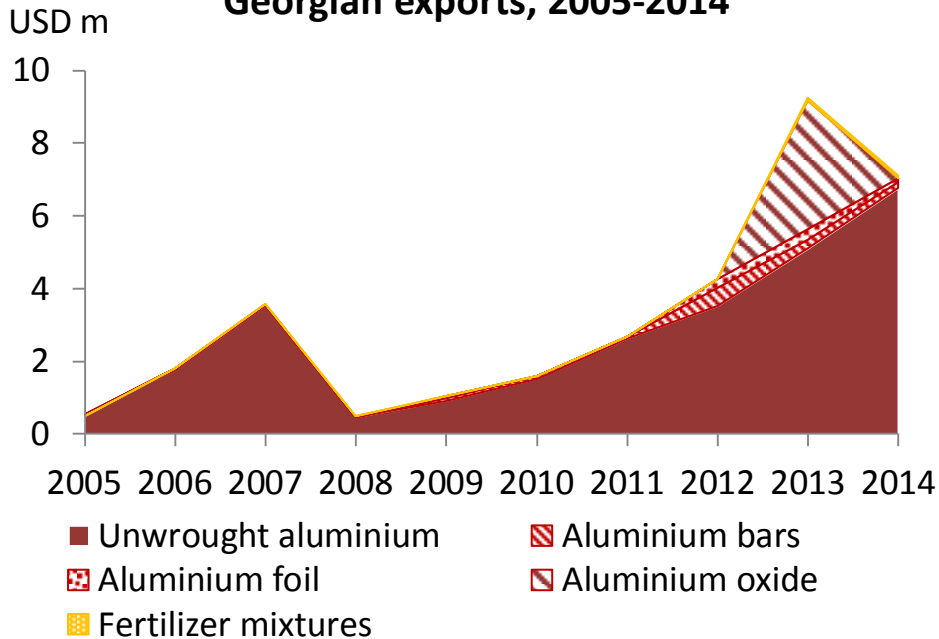


Source: UN Comtrade

- World market volume of ca. USD 100 bn
- 3 Aluminium products account for around 50% of total volume
- Currently, main suppliers are China, Australia, Canada, USA, Germany, Norway
- Large commodity market. Successful entry depends on price competitiveness
- Georgia has access to the large and nearby European import market
- World market prices for aluminium low at present, but likely to recover

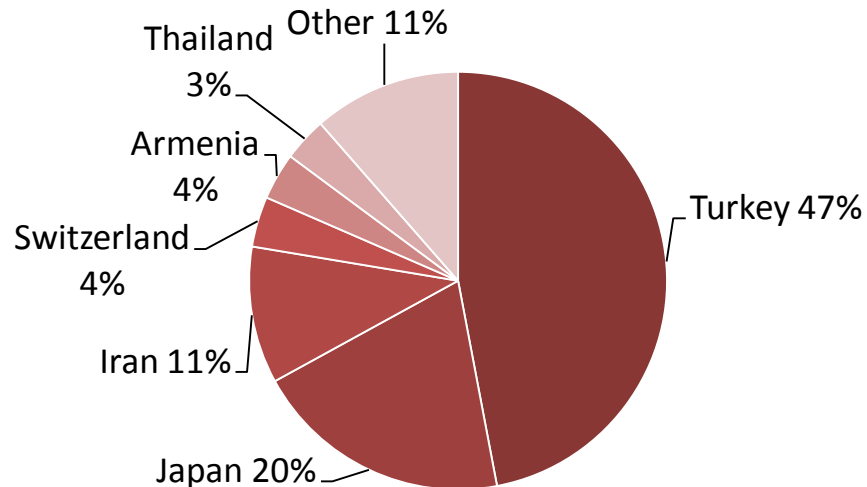
Georgia: Current exports of five energy-intensive goods

Georgian exports, 2005-2014



Source: UN Comtrade

Destinations of Georgian exports, 2014

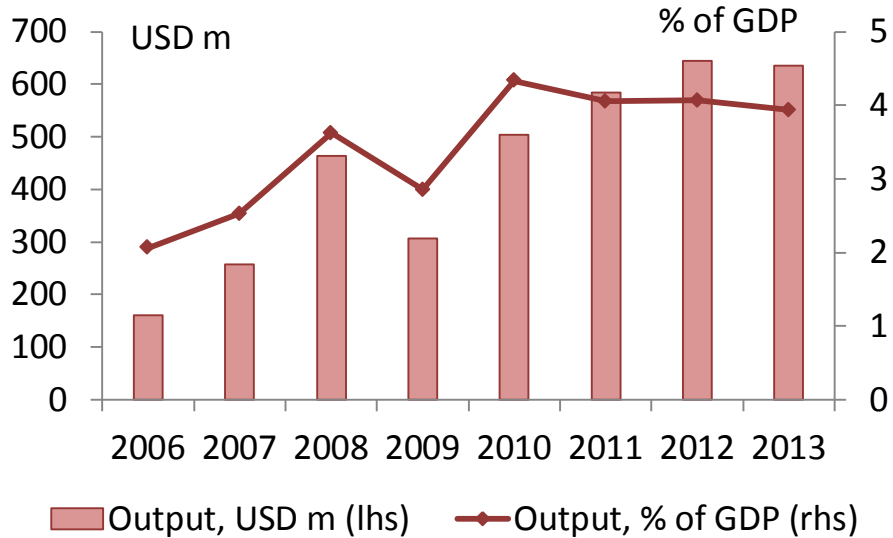


Source: UN Comtrade

- Currently no real production of these goods. Exports of unwrought aluminium at present re-exports from Armenia
- **However, significant production and exports (~USD 100 m/a) of nitrogenous fertilizers (also electricity-intensive)**
- Nitrogenous fertilizers are mainly sold to Turkey and the USA (ca. 60%)
- Potential for trade with Armenia: Aluminium foil plant, but no aluminium production

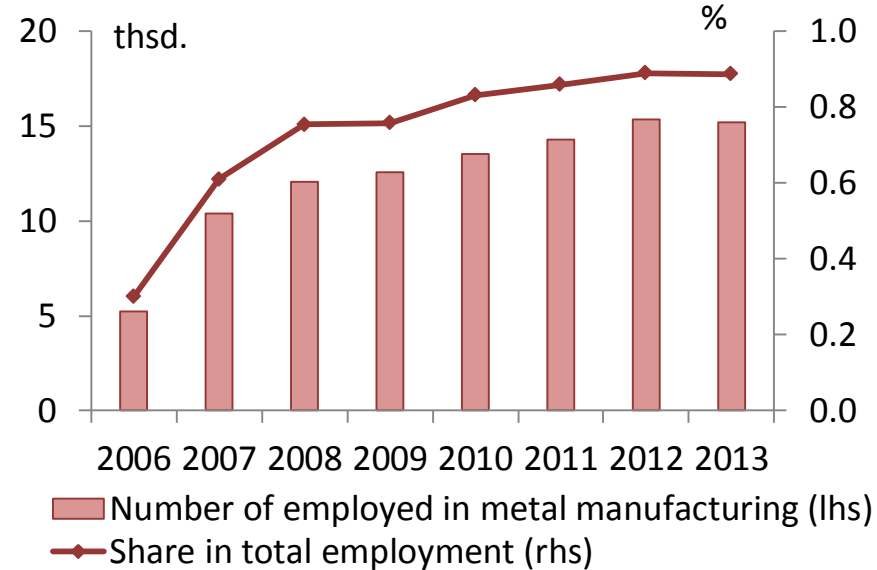
The surrounding industry in Georgia: Metals

Output and GVA metal industry (USD m.)



Source: Geostat

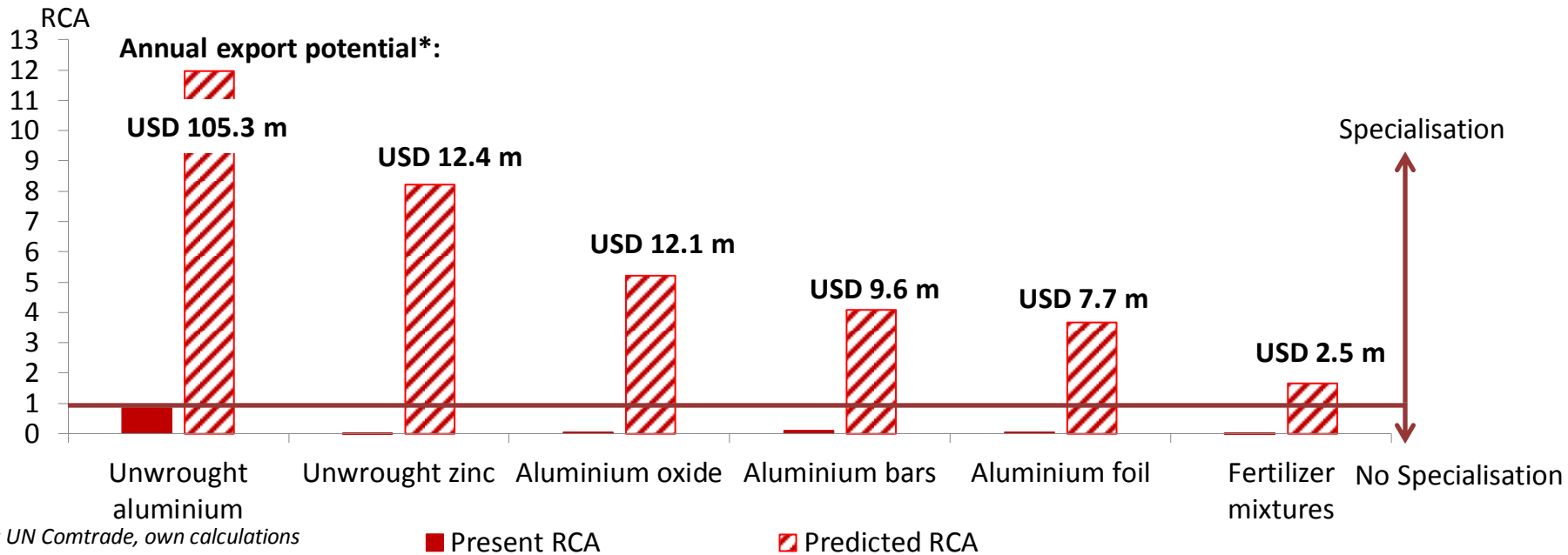
Employment in metal industry



- Aluminium and zinc production are part of the metal industry
- Significant metal industry in Georgia centred on steel (pipes) and ferro-alloys production.
- Plants are largely old, but not necessarily uncompetitive
- Industry has larger share of total output (4%) than of total employment (0.9%)

2. Competitive potential of Georgia

Predicted potential for specialisation of Georgia



Source: UN Comtrade, own calculations

*: Calculated on the basis of 2014 export volumes

- Empirical paper by GET Georgia predicted potential for Georgia to develop specialisation in these goods
- High predicted volumes particularly for aluminium production
- Driven primarily by Georgia's competitiveness in electricity exports
- Other electricity exporters developed specialisations in these goods
- Is this really a potential for Georgia? => Analyse competitive factors

Competitive factors for producing energy-intensive goods

- Electricity and resource availability and costs are, alongside large costs for plant construction, key locational factors for these goods
 - We therefore concentrate on three factors:
 - Electricity prices
 - Domestic availability of natural resources
 - Transport prices for imports and exports
 - The largest exporters of zinc and aluminium presently are:
 1. Russia
 2. China
 3. Canada
 4. Germany
 5. Japan
 6. Australia
 7. Italy
 8. Norway
 9. Austria
 10. Iceland
- **Is Georgia able to compete with these countries?**

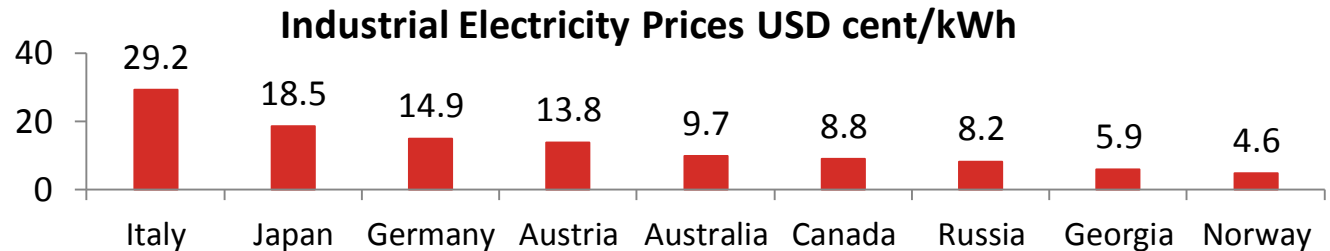
Competitive Factor 1: Energy prices

Importance

Competitive-
ness of Georgia

The bottom line

- Key cost factor: Energy costs make up 20-40% of total costs of aluminium and zinc production



Source: ERRA, EIA, NUC Consulting

- Low electricity prices in Georgia and surrounding countries, competitive compared to other producers
- Additional potential for 3900 MW of hydro power in Georgia
- If electricity market prices in Georgia rise due to market integration with Turkey, self-generation is an option
- Intransparent allotment of construction rights for HPPs
- Fertilizers: Gas prices in Georgia also relatively low, but not as low as in gas producing countries

- **Very good potential for cost-effective energy supply**
- **HPP rights must be allotted in open and transparent manner**

Competitive Factor 2: Domestic availability of resources

Importance

- Main resource for aluminium production is bauxite: around 35-40% total cost of production
- Zinc ore accounts for roughly 30-55% zinc production cost

Competitiveness of Georgia

- Georgia does not have proven reserves of bauxite or zinc ore
- Many of the main suppliers of Zinc and Aluminium also do not have domestic raw material production
- Japan, Norway and Canada import 100% of raw materials
- Main bauxite exporters: Australia, Brazil, India
- Main zinc exporter: Australia, USA, Bolivia
- Import of resources by ship is usually cost-effective
- Also, Turkey is one of the top 10 exporters of zinc ore with 3-5% of world exports. Electricity prices in Turkey are high => Possible opportunity for zinc production in Georgia

The bottom line

- **Lack of domestic resources not a hindrance**
- **Transport conditions and costs are important**

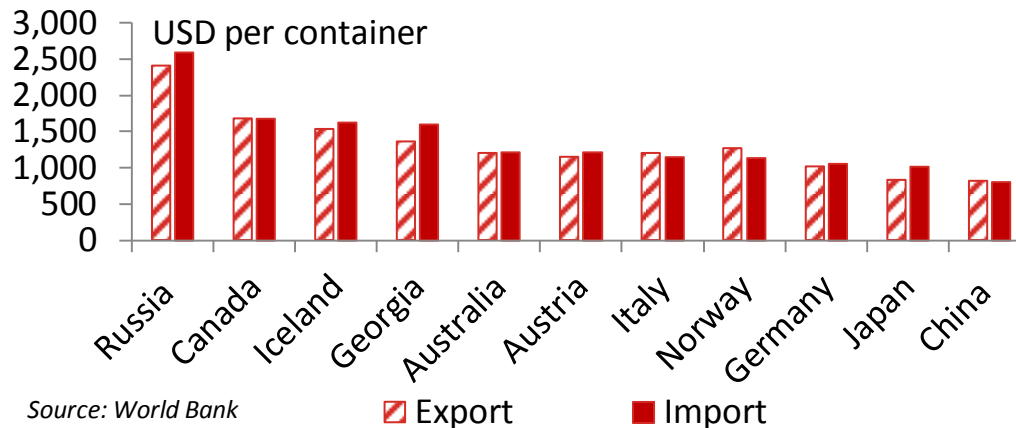
Competitive Factor 3: Transport of inputs and outputs

Importance

- Lack of domestic raw materials: Raw material transport cost are cost determinant
- Need to export outputs to destination markets
- Ports in Batumi and Poti are too shallow even for ‘Supramax’ bulk carriers Planned deep-sea port in Anaklia could handle larger ships
- Rail system within Georgia is undergoing modernisation, but not in good shape now
- Relatively high freight tariffs
- New rail connection with Turkey is completed and will become operational in 2015
- Relatively high freight cost at present due to state of rail system and lack of large port

Competitive-ness of Georgia

Cost to Export-Import



The bottom line

- **Maritime transport feasible and competitive if deep sea port construction goes ahead**
- **Production sites dependent on rail transport may face difficulties**

Policy Implications

- Transparent and open tendering process for Hydro Power Plant sites required, but no favourable treatment of self-generation plants advised
- Energy policy should recognize domestic use of cheap electricity as an objective alongside electricity exports
- Development of port infrastructure is vital for allowing cost-efficient transport of in- and outputs
- Rail system, owned by Georgia Partnership Fund (public investment fund): Requires investment, efficient pricing
- Rail system profits should be reinvested in rail system

Summary and evaluation

Current situation:

- No significant production in energy-intensive goods except nitrogenous fertilizers
- No proven reserves of bauxite and zinc ore
- Large export market in Europe, CIS, Asia

Competitive factors:

- Very competitive electricity prices
- Very low utilization level of hydro power potential (around 18% of total potential)
- Potential for combined production plants with HPPs
- Relatively low gas prices for fertilizer production
- Maritime transport of main resources is feasible
- Port infrastructure so far insufficient, project status of deep-sea port not yet fully certain

Conclusion:

- **Good potential for aluminum or zinc production**
- **Depends on completion of port and rail infrastructure**
- **Predictable energy policy required**

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