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RETHINKING ALUMINUM IN ICELAND’S ECONOMY: BALANCING RISK AND REWARD

Daniel Grande

Introduction

Iceland has a long history of depending heavily on its fishing industry to support its economy. Prior to the 1960s, the majority of people were employed in fishing-related sectors. However, having so many Icelanders with jobs in the same industry presented significant risk. Relying on circumstances as fluctuating as weather and fish stock, the economy was often unstable. Thus, Iceland was welcoming when the aluminum company Alcan showed an interest in the country’s cheap sources of electricity. By 1966, Iceland saw the opening of its first aluminum smelter. The aluminum industry’s rapid expansion and its plant openings in the late 1990s helped drive Iceland’s economic growth.

Today, approximately 45 years after the opening of the first aluminum plant, Iceland faces a problem similar to the fishing era: heavy dependence on one industry. As the fishing industry lies stagnant, unable to grow because of quotas placed on fish harvests, the aluminum industry continues to expand at an accelerating pace. Because this industry contributes a larger percentage to the Icelandic economy every year, overdependence on it is increasing, much as with the fishing industry prior to 1966. In 2008, aluminum became the single largest source of exports from Iceland. Although this spurs growth, it also creates dependence and an expectation to constantly enlarge aluminum output to keep the economy going.

Beyond their common contributions to the Icelandic economy, there are many differences between the fishing and aluminum industries. For example, all aluminum smelters in Iceland are owned by foreign companies whereas all fishing is owned by Icelandic citizens. The two industries also have very different market structures. While the fishing industry is highly competitive, aluminum is concentrated in a few large firms. These differences present challenges both new and old.
On one hand, Iceland has dealt with the situation of overdependence in the past. By limiting overfishing via quotas, Iceland was effectively able to restrict the growth of the fishing industry. Moreover, by attracting the aluminum industry, Iceland diversified its previously limited economic portfolio. On the other hand, if Iceland were to attempt to impose restrictions on foreign owners for fear of overdependence, it may strain those relationships. If restriction became stifling enough, the foreign firms could end up looking elsewhere to continue their operations.

This article explores the aluminum industry’s current and future situations in Iceland. First, a cost-benefit analysis assesses the value of the aluminum industry to Iceland. Second, the instabilities that the industry can cause in the country are examined. The article concludes with a proposed course of action and identifies potential opportunities beyond the aluminum industry that Iceland should consider.

A Brief History of the Aluminum Industry in Iceland

Since Nordic explorers first settled approximately a millennium ago, natural hot springs have provided Iceland renewable energy. More recently, emerging technologies enabled further exploitation of renewable resources and transformed Iceland’s utilization of energy. The first municipal hydropower station was built in 1921, followed in 1969 by Iceland’s first geothermal power plant. (“Bjarnarflag—Iceland’s First...”) Hydropower and geothermal power became major sources of clean energy, replacing coal and oil for electricity and heat. Icelanders realized the resource value of inexpensive energy, and—in contrast to their long-standing strict controls against foreign ownership in fishing—began to open up to the potential opportunities that foreign investors seeking cheap energy could provide.

The companies most interested in cheap electric rates are those for whom electricity is a large and vital part of production. The smelting of aluminum is an extremely energy-intensive process. For an average aluminum plant in the United States, energy makes up roughly a third (depending on prices) of the total cost. (Rocks and Minerals) Mined bauxite contains approximately 50% alumina, a compound of aluminum and oxygen, which is chemically dissolved and extracted from the bauxite. Then, an enormous electrical current, approximately 100,000 to 320,000 amps, is run through giant pots of molten alumina. (Rio Tinto Alcan) The end product, aluminum, is tapped from the pot and cast into aluminum ingots.

Before aluminum, Iceland shied away from large-scale foreign investment in its economy. This was especially true in fishing; government-mandated restrictions declared that only Icelandic citizens could own ships. (Gunnarson) Iceland did not hold this attitude toward energy-intensive industries because the Ministry of Industry saw an opportunity to diversify an economy too heavily reliant on one industry while simultaneously exporting Iceland’s abundant energy resources, which are difficult to export directly.

Like most Nordic countries, Iceland depends heavily on exports. In 2010, exports made up 39 percent of the GDP. (The World Factbook) At the same time, Iceland does not have a wide variety of goods to export. In 1968, a year before aluminum operations began in Iceland, 86.5 percent of exports were marine products. Agricultural products were a distant second at only 8.8 percent of total exports. (Statistics Iceland) With such a concentrated source of income, Iceland’s economy as a whole was subject to volatility. The source of this volatility was mainly weather and ocean conditions. If ocean conditions were especially harsh one season, and not as many fish were caught, negative shock waves could be sent through the entire economy of the country.

To combat this problem, in 1961 the Icelandic Ministry of Industry formed the Industrial Development Committee. (Skulason) Its purpose was to figure out the best industries for which low-cost energy might be attractive for expanding. When the aluminum industry began to show an interest in Iceland, the committee took advantage. As recognition grew of the significantly cheaper electricity present in Iceland, combined with the Icelandic government’s initiative for economic diversification, Alcan (now known as Rio Tinto Alcan) began negotiations with the Icelandic government. By 1966, construction on Iceland’s first aluminum smelter had begun.
In 1969, Alcan, a company based in Canada, began operations with a capacity to produce 33,000 tons per year. Nearly 30 years later, in 1998, U.S.-based Century Aluminum opened the second smelter in Iceland, and in 2007, U.S.-based Alcoa opened the third and most recent smelter. Currently the three aluminum smelters in Iceland combined have a maximum capacity of 791,000 tons per year. Expansion continues as Alcoa is planning to construct another smaller smelter, and both Rio Tinto Alcan and Century Aluminum are planning to expand their current facilities. If these plans come to fruition, ultimate production capability of the country could increase by 51 percent to 1,265,000 tons per year by 2015. (Kristofersson et al.) On the surface, this seems a win-win situation for everyone involved. Iceland achieves greater economic stability, new jobs, and tax revenue while aluminum companies pay relatively low energy costs. However, by weighing the real economic benefits and costs of the aluminum industry, the industry’s planned expansion can be evaluated.

Overview of Macroeconomic Growth Spurred by the Aluminum Industry

Market Structure

The first step in understanding the cost-benefit analysis of aluminum smelting in Iceland is to understand the overall market structure of the industry. Aluminum smelting, like most large-scale manufacturing industries, has huge economies of scale because of large capital costs needed for massive and specialized machinery. Other inputs of production, such as labor, electricity, and alumina, have comparatively constant unit costs. Therefore, the average unit cost of running a plant can be reduced by producing more aluminum for a given amount of capital. If a facility expands production output, there is more profit generated per plant. Additionally, the high up-front capital costs create a significant market entrance barrier and deterrent for potential competitors. Altogether, only 30 different companies own all of the aluminum smelting facilities in the world. (Alcor Technology) The two biggest companies with operations in Iceland, Alcoa and Rio Tinto Alcan, each control approximately 10 percent of the entire world market. (Alcoa) This makes for a concentrated market in which a small number of companies control a large portion of world production.

Many of these market features also apply to the hydropower generation business. Because aluminum facilities are large and usually expected to grow larger, hydropower dams with the sole purpose of providing electricity to aluminum plants have been built in Iceland. Currently, these projects are controlled by Landsvirkjun, the national power company of Iceland, which was initially founded in order to provide electricity to foreign-owned power-intensive industries. (“Landsvirkjun’s History”) Like the aluminum industry, hydropower plants require large amounts of capital, and thus are subject to economies of scale as well.

With power plants and aluminum smelters requiring large capital investments, it is in the interest of both parties to negotiate contracts for as long term as possible for long-term income and cost stability. Current contracts between Landsvirkjun and the three aluminum companies have been written so that they last for 40 years. Although the specific details of the contracts are not public information, it is known that the price of electricity moves based on the world price of aluminum and that renegotiations of price specifics occur at the halfway point (20 years) of the contracts.

When the Ministry of Industry chooses to undertake an aluminum smelting project, it must be prepared for long-term involvement. By committing, the industry has the security of long-term prices while the country gains the security of long-term income and job creation. This is part of the reason that aluminum has become such a deep-rooted industry in Iceland. With a big industry in a small country and long-term partnerships, dependence on the aluminum industry has grown and continues to grow. In fact, it has grown so much that in terms of macroeconomic impact, aluminum now outweighs fishing as the most important industry in Iceland.

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1A large portion of the discussion in this section was taken from the report by Kristofersson et al., “The Effect of Power Intensive Industrial Developments on the Icelandic Economy,” and from Statistics Iceland.
GDP Analysis

One of the best ways to gauge macro-economic effects is to examine the industry’s effect on Iceland’s GDP. Aluminum constituted 39 percent of all exports and 17.5 percent of Iceland’s GDP in 2008. In that year, aluminum passed fishing products as a percentage of GDP for the first time in the country’s history. One of the main reasons for the unequal growth trends is the implementation of the fishing quota system in the 1970s. By limiting the number of fish that commercial fishing vessels may catch, the quota system reigned in the growth of the industry in order to protect the crashing fish stocks. Since then, the industry growth rates for aluminum relative to fishing have diverged. As Figure 1 shows, on average during this period, fishing has declined and aluminum expanded as a percentage of the value of exports until 2008 when aluminum reached approximately the same level as fishing.

In order to fully evaluate the industry, value-adjusted GDP must be taken into account. Value-adjusted GDP also incorporates the negative effects that the aluminum industry may have on GDP. The production of aluminum ingots requires importing the raw material alumina. Iceland would have no need to import it if not producing aluminum. The importing of any product has a negative effect on the balance of trade; thus, alumina has a negative effect on Iceland’s overall GDP. Alumina imports contributed a negative effect of 5.6 percent of GDP in 2008. By combining beneficial and negative effects, the value-adjusted GDP of aluminum is revealed to be 11.9 percent in that year. The net effect of the aluminum industry on the GDP can be seen in Figure 2.

Although aluminum smelting in the country has grown rapidly over the past decade, with all three firms planning capacity expansions, it shows signs of accelerating even more over the next 5 years. So, economic dependence on the industry will also continue to grow. Yet, reducing dependence on one industry, fishing, is exactly why the aluminum smelting industry was brought to Iceland in the first place. GDP, however, is not the sole indicator of economic value. Another consideration when determining the costs and benefits of the aluminum industry is profit analysis.

Profit Analysis

When the aluminum industry is making profits, where do the profits go? A small percentage of profits is reinvested into maintaining capital but the majority leaves the country in the form of dividends to foreign owners. When dividends leave Iceland, they are a negative export in the balance of trade, reducing the industry’s overall economic benefit.

Not all profits flow out of the country. Icelandic corporate taxes also play a role in where profits go. The agenda in the mid 1990s was to privatize more business in Iceland. During this time, the national budget was successfully balanced and the passing of business-friendly legislation was continued. From 1990 to 2003, legislation reduced the corporate tax from 50 percent to 18 percent. (Ólafsson) With the decrease in taxes, previously unprofitable expansion projects became attractive options. Thus the mid 1990s and 2000s were a period of rapid expansion in aluminum production. As shown in Figure 3, the lowering of taxes actually spurred an increase in government revenues. In other words, by lowering the corporate tax rate, the Icelandic government has been able to effectively spur growth and extract more tax revenue from the aluminum industry and labor taxes on newly created jobs.

Conclusions Based on Cost-Benefit Analysis

A cost-benefit analysis of the aluminum industry in Iceland helps reveal exactly what this industry means to the country. As shown by export and GDP percentages, it has become a large and deeply rooted part of the Icelandic economy. Further analysis of net GDP reveals that its overall economic benefits are not as large as they first appear. Additionally, the Icelandic government has found an effective way to extract more tax revenue from the industry through the lowering of corporate taxes. However, as the aluminum industry’s relative size continues to grow, some of the risks associated with the industry become more important to the health of the whole Icelandic economy. Therefore, this analysis turns to the risks associated with the aluminum industry.
Figure 1
Exports by Category, 1950–2009, as Percentage of Exports

Source: Statistics Iceland.

Figure 2
Net Effect of the Aluminum Industry on the Balance of Trade as a Percentage of GDP

Source: Statistics Iceland.
Economic Instabilities Caused by the Aluminum Industry

As large an export as aluminum is for Iceland, the total is but a small fraction of the world’s overall aluminum production of 40 million tons per year. Because Iceland only produces 2 percent of the world’s aluminum, it alone has little leverage in swaying market aluminum prices one way or another. Because of this, and the nature of aluminum as a commodity, aluminum producers in Iceland must take prices as they are set by world markets as a whole. Although aluminum is not nearly as volatile as, for example, fishing or agriculture, it is still susceptible to market fluctuations in price. As an export, aluminum is also susceptible to currency fluctuations because of the structure of the contracts between aluminum companies and Landsvirkjun. With the growing scale of the industry, these risks are becoming magnified to the country as a whole.

Dependence on Aluminum Prices

Theoretically, aluminum plants have polar opposite production options: run at full capacity producing as much as possible to keep average unit costs low, or produce nothing. As long as the price of aluminum is high enough to cover all variable costs (largely labor, raw material, and electricity inputs), then plants will continue to produce at full capacity. If, however, aluminum were to fall below a critical price level where variable costs were no longer covered, management would choose to produce nothing. Because of economies of scale, there is only a small number of large plants. Even if only one of the three plants in Iceland were to shut down, a large number of jobs and incomes would be lost, and overall GDP would drop. It is difficult to predict exactly how many people would be affected, but two job types—manufacturing and energy—would be hit hardest (Figure 4) if an aluminum plant shut down. Manufacturing applies directly to the aluminum smelters, whereas energy providers would be hurt due to loss of business with the aluminum

Figure 3

Iceland’s Corporate Tax Rate vs. Corporate Tax Revenue

Corporate Taxes as a Percent of GDP (Left Scale) Corporate Tax Rate (Right Scale)

Source: Gissurarson and Mitchell, p. 4.
facilities. As indicated in Figure 4, however, wiping out all 3000 or so jobs in both these sectors would only amount to approximately 2 percent of the workforce. Not shown in Figure 4 are all the secondary jobs and economic activity spurred by the aluminum plants. Building a new plant creates many new jobs and sources of income external to the plant itself, including construction of infrastructure near a plant, freight transportation of inputs and outputs, and even increases in local shop sales. All of these would also be greatly affected if an aluminum plant were to close. Independent economic analyses of the industry suggest that for each direct aluminum job, there are actually 3 to 3.5 times that many jobs created in the country (NYSIR & UARI), closer to 7 percent or 10,000 jobs affected by the aluminum industry. The chance of aluminum prices dropping far enough for a shutdown to happen anytime soon is highly unlikely, so this is not a short-term risk; however, it is a potential long-term risk. (Kristoferson et al.)

Even if unlikely, a shutdown was a real fear for Icelanders when initially considering starting the aluminum industry in their country. Therefore, they came up with a way to hedge against the risk. Contracts between aluminum companies and electricity providers in Iceland were designed with a floating price of electricity. That is, the price of electricity moves as the price of aluminum, in U.S. dollars, moves. This assures that aluminum companies’ variable cost in electricity shifts with the price of aluminum. Additionally, all payments between smelters and power companies are in U.S. dollars to avoid any exchange rate risk the foreign-owned aluminum companies could face. This in turn transfers much of the exchange rate risk and aluminum price fluctuation risk onto Landsvirkjun. For all intents and purposes, this should keep aluminum smelters permanently open. Iceland has chosen to forge contracts that sacrifice a certain amount of short-term stability in income from electricity prices to avoid possible long-term aluminum industry shutdown. Although this is reassuring for the long term, it does inject some uncertainty in the short term, as recently witnessed with the economic collapse of 2008. Because production continued at full capacity, even though demand sharply dropped, aluminum prices dropped from $1.50/lb to $0.58/lb, a decrease of approximately 60 percent, in a matter of 5 months. (Kitco) The way Landsvirkjun handles this type of risk is discussed in the next section.

**Risk Assessment of Landsvirkjun**

Landsvirkjun, Iceland’s national hydroelectric energy producer, produces three times as much electricity for use by the aluminum industry than for all other uses in the entire nation combined. (“Landsvirkjun’s History”) Because of this, foreign aluminum owners hold substantial bargaining power to forge contracts that pass much of their risk onto Iceland. So, Landsvirkjun takes steps to hedge against both aluminum price risk and exchange rate risk. Typical of commodities, world aluminum prices vary quite a bit. The direct contractual link to electricity prices in turn means that fluctuation in the profits of Landsvirkjun is not uncommon.

In addition, there are two sources of currency exchange rate risk. One is the risk from foreign loans used to finance the hydropower facilities. The effective interest rate on loans can change based on exchange rates. Landsvirkjun prefers the Icelandic króna to strengthen against these currencies, making the loans less expensive. The second type of exchange rate risk is in those Landsvirkjun operating costs that are in króna (e.g., payroll). Although a relatively small portion of expenses, what this means is that Landsvirkjun is also susceptible to risk occasioned by króna-dollar exchange rate fluctuations.

Because electricity companies are public, there is additional pressure on them to maintain steady income rates. During the financial crisis of 2008, this was especially important, so different efforts have been made to make sure Landsvirkjun has a stable cash flow. To battle currency fluctuations, currency swaps have been utilized heavily. Loans have been taken out in at least five different currencies, and Landsvirkjun holds currency swaps in all of them against the króna. To battle aluminum price fluctuations, Landsvirkjun utilizes different types of financial derivatives. Landsvirkjun has been using futures contracts

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1 A majority of the information in this section comes from Guðmundsdottir and Halldorsson. Annual Report 2009. Landsvirkjun.
and exchange-rate derivatives to lock in prices for aluminum no matter which direction the market moves. In 2010, Landsvirkjun was given authority by the Icelandic government to hedge 100 percent of its electricity output with aluminum futures contracts due to unstable conditions in the wake of the financial crisis. However, the allowed hedging percentage of electricity output will be reduced over the next ten years. If the economy improves, markets should be more stable by 2020; this decreasing hedge percentage makes Landsvirkjun more susceptible to fluctuation risk.

**Conclusion about Risks Presented by the Aluminum Industry**

Although the aluminum industry was initially brought in to stabilize the economy, it is not without risks of its own. This is especially true because the aluminum companies have shed onto Landsvirkjun a large portion of their operational risk, hedging against which can become costly in a volatile market such as aluminum. Ultimately, two big sectors, aluminum and energy, are tied to aluminum prices. But because of employment multiplying effects and taxes, employment and government revenue also become a function of aluminum prices. Altogether, this doubles down the bet on aluminum for sustaining the economy. Diversifying the Icelandic industry sector would be a good way to decrease the influence of aluminum prices on the Icelandic economy.

**Diversifying Iceland’s Energy-Intensive Sector**

In short, aluminum companies have been able to transfer much of their risk to Iceland. Additionally, due to their continually growing size, they are concentrating economic activity. To mitigate the risks and concentration, industry diversification is desirable for the stability of the national economy. Because the risks associated with various industries differ, a mix of industries diminishes the negative impact on the country as a whole if one fails. With the fast growth of the aluminum industry, Iceland is, however, “putting all [its] eggs in one bas-
ket,” according to Andri Magnason, a writer and filmmaker critical of the industry. (Chu) What can Iceland reasonably do moving forward? Despite size constraints, a few options that Iceland has begun to pursue can help steer its economy in a more sustainable long-term direction.

**Capping the Aluminum Industry**

If allowed to grow unchecked, the aluminum industry might begin to dwarf the fishing industry, and the entire economy could be at the whim of fluctuations within one market again. In order to prevent aluminum from becoming too large, the Icelandic government could put restrictions on growth. It is not suggested that the government ask the industry to stop expansion altogether but instead throttle down its recently accelerated growth. If this is done in conjunction with diversification of the economy by bringing in other power-intensive industries, then the relative dependence on aluminum would diminish but its substantial importance in the economy maintained.

So far, Iceland has not taken direct action in this regard, because it is often difficult to impose these types of regulations once an industry is in place. Also, there is a growing environmentalist and anticorporation movement among the populace that is asking the government to stop or reduce the building/expansion of aluminum plants and hydroelectric dams. (Grist) Some groups, like singer Björk's activist organization, Náttað, are looking to spur new smaller industries to use Iceland’s energy rather than heavy industry. (Kanter) Other groups, like the Iceland Nature Conservation Association, are concerned with protecting the environment from hydropower development altogether. It is difficult to know for sure, but as pressure from these groups mounts, the Icelandic government may become a more active listener to these concerns. As with the aluminum industry, it becomes harder to impose restrictions as political power and size of industry grows. It may be worth planning and easing into restrictions now before new industries come to Iceland, if that is the direction that the country wants to take.

**Moving Away from Overdependence on the Aluminum Industry**

Methods that Iceland can use to alleviate overdependence are decoupling electricity contracts from aluminum prices, diversifying the manufacturing sector, and bringing other energy-intensive industries to Iceland. A new pricing strategy recently implemented in contract negotiations between Rio Tinto Alcan and Landsvirkjun helps balance the risk sharing. As of October 2010, Landsvirkjun and Alcan Iceland have removed the link of the price of power to the price of aluminum. Instead, it is now linked to the U.S. consumer price index. (“Landsvirkjun and Alcan …”) This is Landsvirkjun's first successful attempt at creating a more balanced risk sharing model, which it hopes to achieve eventually as well with the other two aluminum companies in Iceland.

Another way the country could reduce aluminum dependence is by attracting other energy-intensive industries. Within the past decade Iceland has been diversifying itself through software production, biotechnology, and tourism. (The World Factbook) Iceland sits on an enormous potential for cheap electricity: Why not hedge the bet on aluminum by inviting other types of energy-intensive industries that would love a chance for cheap electricity?

Landsvirkjun has begun to move in this direction. Currently, there are five medium-sized, non-aluminum manufacturing plants in Iceland producing fertilizer, cement, rock wool, algin, and salt. (Randburg) These manufacturing facilities not only utilize domestic sources of electricity but also gather their needed raw materials locally. Thus Iceland does not need to import raw materials as for aluminum. Individually these sectors are small relative to aluminum in both size and income potential, but as a collective, they can be regarded as a large industry. Aluminum alone constitutes 33 percent of the value of all manufacturing in Iceland whereas all other manufacturing processes combined (other than food/fish products) constitute only 18 percent. (Statistics Iceland) However, the number of non-aluminum industries is growing as Landsvirkjun is actively seeking to recruit more small energy-intensive indus-
tries through cheap electricity prices. For instance, in February 2011, Landsvirkjun signed a contract with Icelandic Silicon Corporation to provide 65 MW of power to its new 40,000-ton silicon production facility, which is expected to create approximately 100 jobs. (“Landsvirkjun and Icelandic …”) Continued pursuit of these types of industries and agreements is one of Landsvirkjun’s main objectives moving forward in order to reduce relative dependence on aluminum.

One new large-scale industry that Landsvirkjun is pursuing is the data server industry. This industry deals in recording and serving out information for a wide array of businesses. Companies will spend an additional 40 to 60 percent of the basic cost of running a server just in cooling them down to keep them from overheating. Although big Internet companies, like Google, dominate this industry with the enormous amounts of data they are forced to handle, many other types of companies—banks, for example—need servers as well to handle large amounts of data.

Iceland is a particularly attractive place to set up data farms. It has cheap electricity used to run the servers, and its naturally cold environment can alleviate overheating. Simply put, running a cooling facility needs less energy because of the already cold air. The way that data farms work is that a single company owns the server facility and leases out server capacity to other companies. Because of economies of scale in maintaining and cooling such server farms, it can be less costly per unit storage capacity to run huge farms than for individual companies to run their own independent servers.

Iceland has negotiated one contract with Verne Holding Company for a project slated to begin operation in 2015 and has the potential to create about 100 new jobs. (“Landsvirkjun to Supply…”) The most important question to ask about the development of another large-scale industry is how big it will become. If data farms become another booming industry, many of the same problems currently present in the aluminum industry may reappear down the road. Alternatively, having three big industries—fish-

ing, aluminum, and data farms—is better diversification than having just two large industries. Having these three industries competing with one another is an effective way to reduce the overall risk to the economy. All three industries encompass different sectors and, combined with smaller industries such as biotechnology and ferrosilicon, Iceland will have a nicely diversified portfolio and can effectively reduce its dependence on aluminum.

**Conclusions about the Aluminum Smelting Industry in Iceland**

The Icelandic economy has a long history of dependence on one type of industry. For many hundreds of years, that industry was fishing. However, over the last half century, fishing has been gradually overtaken by the aluminum smelting industry as the largest export. As the relative size of the fishing industry shrinks, both the absolute and the relative size of the aluminum industry continue to grow. Analysis shows that the aluminum industry is an extremely beneficial industry for Iceland. It has created jobs, increased corporate tax income, and increased the overall economic prosperity of the country. However, aluminum is not without risk and many of these risks are borne by the Icelandic nation. Thus it is key that Iceland reduce its overdependence on the aluminum industry. The relative size of the aluminum industry in Iceland can be reduced by increasing or introducing other industries in Iceland. The cheap price of electricity makes this possibility exceptionally appealing to energy-intensive industries. By inviting them, Iceland can help diversify its economy and bring further prosperity to the country.

Iceland took a great step forward when the aluminum industry was introduced nearly 45 years ago to help diversify and stabilize the economy. But now it is time to take the next progressive step. Diversification is necessary for further growth and stability. Iceland has plenty of energy to utilize, and doing so in new and creative ways will be what helps Iceland reach that next level of economic prosperity.
REFERENCES


