Chile's Energy Efficiency Agenda

INSTITUTE OF THE AMERICAS

Energy efficiency is at the core of Chilean President Michelle Bachelet's Energy Agenda. The potential benefits for the country are manifold, from reducing energy costs, to boosting economic growth, to improved health, and contributing to global carbon emissions reductions. Chile's government has already announced several initiatives that will contribute to its goal of reducing energy consumption by 20 percent by 2025. However, real change must be backed by a strong regulatory framework, as envisioned by the nation's ambitious Energy Efficiency Law. The new legislation, which has received significant support from the private sector, should be in place by the end of 2015.

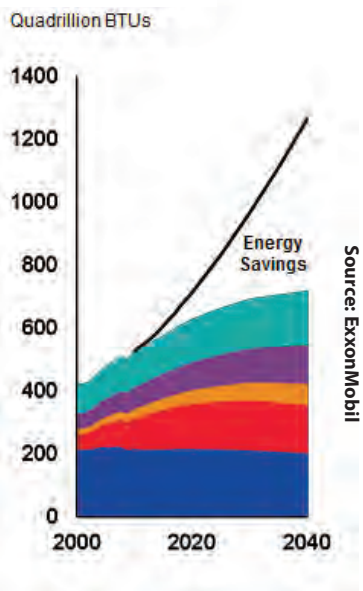
Chile's initiatives join a growing energy efficiency trend at the global level and the nation must be careful not to squander a "golden opportunity" to capitalize on political will and public-private collaboration. Given the timing of the new energy efficiency legislation, Chile has the opportunity to ensure its efforts are informed by best practices from markets such as California. One of the most critical lessons learned is that effective communication of these changes will be vital to ensure popular support for the nation's energy efficiency agenda.

Efficiency as an Energy Source

Globally, energy efficiency has become one of the most important 'sources' of energy. Over the coming decades, trends indicate a decoupling of energy consumption and GDP, as increased efficiency sees global energy demand plateau while global GDP continues to rise (see Figure 1). Meanwhile, the global energy efficiency market is flourishing. The International Energy Agency estimates that investment in global energy efficiency was between $310 and $360 billion in 2012. This was larger than supply side investment in power generation from renewables, coal, oil, or natural gas. And efficiency markets are expected to continue to grow.

Chile has lagged behind its Latin American neighbors in this space but as energy efficiency initiatives gain ground, there are ample opportunities for this nascent 'energy' sector. Nevertheless, Chile will need to make some aggressive policy moves if it is to reach its energy efficiency target. The government's commitment is evident in the expansion of the budget and mandate of the Chilean Energy Efficiency Agency (AChEE) as well as the efforts stipulated in the Energy Agenda to pass sweeping legislation by the end of the year.

Figure 1: Energy Consumption and GDP Growth



Source: ExxonMobil

Undeniably, these initiatives involve a cost. Yet with energy saving programs starting at less than 2 cents per kilowatt hour (kWh), this is far cheaper than the cost of producing energy, particularly in Chile. The potential returns are even greater. It is estimated that reducing Chile's energy demand by 1 percent would save 2.5 GW of power generated and $5 billion. These are funds that could be directed to other budgetary needs.

Within the power sector, the long-awaited interconnection of the nation's two major power grids — the Central System (SIC) and the Northern System (SING) — marks an important first step. Proposals to increase connectivity with Chile's Andean neighbors will not only improve energy security and reduce costs but will also boost efficiency for consumers on both sides of the cross-border connection.

Chile's intended new energy efficiency framework will also go beyond the nation's power sector. The strategy encompasses five pillars, covering

commerce, industry, transport, public sector, and housing. More strategic urban planning in cities and towns will address many of these areas.

Energy Savings For Big Consumers

Chile's largest power consumers will be among the first targeted by the new efficiency measures. Chief among these is the mining sector, which is responsible for an estimated 30 percent of Chile's electricity consumption. The country's mining industry is also one of the major contributors to Chile's economy, accounting for an average 13 percent of GDP over the last decade. Ensuring that efficiency does not come at the cost of productivity is one factor that must be taken into consideration.

Another challenge for Chilean regulators is the international nature of the mining business. The global mining industry has efficiency standards of its own, giving rise to concerns that companies with pre-existing efficiency plans may be less receptive to changes to their established business practices. For this reason, it is critical that the Chilean government work closely with mining companies and industry bodies throughout the development of the new law to facilitate private sector buy in and ongoing support.

The Chilean government is keenly aware of the importance of accountability in rolling out the new efficiency program. And while many of the details remain to be fleshed out in this year's Energy Efficiency Law, the government's Energy Agenda makes clear that far greater oversight is required. This will include regular energy audits to monitor progress and measure efficiency outcomes.

Beyond mining companies, large consumers in Chile include shopping centers, cement plants, pulp mills, and other major manufacturers, each of which must be incorporated into any national energy efficiency strategy.

Efficient Planning

Urban planning will play an important role in reducing energy consumption and increasing efficiency, particularly in large cities such as Santiago. This includes better planning for new and upgraded transport, and efficiency in public buildings and spaces, as well as residential homes.

Chile's transport sector is ripe for change. In 2013, transport accounted for 20 percent of energy consumption, and over 50 percent of the nation's petroleum, the majority of which is imported. According to the Centro Mario Molina, the transport sector is responsible for 36 percent of the nation's CO2 emissions. Increased efficiency of public and private transport options would reduce the nation's dependency on oil imports, contribute to Chile's climate goals, and improve the health and wellbeing of its citizens, particularly in the capital Santiago where pollution has become a serious concern.

In June 2015, the government announced the first environmental emergency in Santiago in 16 years. In response to declining air quality, the city dramatically reduced vehicle circulation, taking 80 percent of the most polluting cars and 40 percent of modern cars off the road. The regulations also restricted public transport, prohibited wood-burning fires, and recommended that schools avoid physical education classes outdoors. In part this is due to the persistent drought conditions. But the nation's capital has also seen an 83 percent increase in the number of cars on the road over the last decade.

Mass transit is another key area. Between 2008 and 2022, an estimated 6,000 Santiago buses will need to be renovated. Of these, 2,000 could be replaced by electric vehicles, representing 60 percent energy savings, according to the Energy Ministry. Santiago inaugurated its first electric bus route in 2014 but this program should be expanded.

Chile also aims to improve the efficiency of public buildings. Between 2015 and 2017, the AChEE is implementing a $15.5 million (CLP 10 billion) program to increase efficiency in the nation's hospitals. In 2015, 14 hospitals will be targeted at a cost of $4.7 million. Still, the government expects a two year return on its investment in addition to 13 percent energy savings, which is equivalent to

173 GWh per year or approximately 7450 tons of CO2 emissions reductions.

In terms of residential energy use, Chile falls behind much of the region in digitization. Net metering and distributed generation have significant potential to increase efficiency and renewable energy deployment, in particular rooftop solar power, which has taken off in the United States and Europe.

But electricity is just one piece of the puzzle. Around half of all energy consumption in Chilean households stems from heating water. Central heating and household appliances are also large contributors often left out of the debate. Establishing efficiency standards and labels for household appliances is one of the Energy Agenda's action items. Taking advantage of lower costs, efficiency, and storage for solar power, combined with some incentives should help Chileans adopt the technology more quickly.

Renewable Energy

Expanding the deployment of renewable energy can also be a driver of energy efficiency in Chile. Targeting efficiency initiatives to the hours when the load increases can help smooth the demand curve and compensate for intermittent renewable sources, such as solar and wind. Chile has suffered backlash against large-scale hydropower projects, notably the Hidroaysén dam, but the nation has significant potential in non-conventional renewable sources, including wind, solar, and small-scale hydro power.

In southern Chile, a reliance on biomass has polluted cities and homes, with serious health implications for children in particular. Wood still comprises 20 percent of Chile's primary energy matrix. The government is working with communities and more than 20,000 biomass producers on sustainability and forest protection. Renewable energy could also play a role.

Interconnection

Increased interconnection, both domestic and international, has long been a goal for Chile. The interconnection of the two largest national grids, SIC and SING will bring 98 percent of Chile's consumers into the same power system. Given the country's diverse climates from north to south, the interconnection of both grids will allow the national system to better balance wet and dry seasons to ensure a more efficient use of Chile's domestic and imported power.

Regionally, progress on the Andean Electric Interconnection System (SINEA) has moved slowly, in part due to the significant political capital required to keep the project on track. There are five major barriers to interconnection, each of which is rooted in geopolitical history. 1. *Sovereignty*: An aspiration to energy independence and desire to avoid becoming dependent on one's neighbors; 2. *Protection*: A need to protect and control a nation's natural resources; 3. *Regulation*: A wariness or even opposition to regulatory or legal changes; 4. *Quality:* A fear that the quality or security of supply could be affected by exchanges; and 5: *Cost*: A concern that interconnection could increase costs.

To address some of the political hurdles, nations such as Chile could look to the interconnection process in Central America as a successful case study.

Bilateral agreements can also provide an intermediate step that builds momentum for regional accords. Chile's renewed interconnection efforts with Argentina and transmission proposal for Peru are examples.

An interconnection with Argentina is particularly important as it will give Chile access to a market even greater than its western neighbor. Argentina's connection with Paraguay and Brazil adds significant hydropower potential from the rest of the Southern Cone. In addition to the efficiency gains and cost reductions, the project

will help countries better cope with a changing climate. Operator AES Gener hopes the connection will bring more renewable power online and improve backup capabilities in the event of emergencies, such as earthquakes.

The potential savings of interconnection are compelling. The first transmission line connecting Peru and Chile, for example, is expected to save $90 million in energy costs. The second line is estimated to bring $450 million in savings.

Lessons from California

Since 1975, California's electricity consumption has remained virtually flat, while the rest of the United States' consumption has almost doubled. This is in part due to aggressive green energy and efficiency policies that have meant Californians use far less energy than their counterparts.

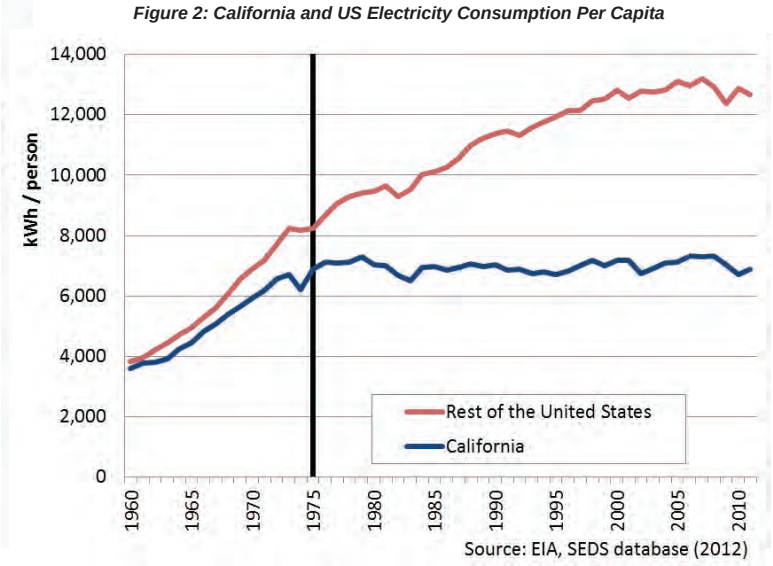
According to the California Public Utilities Commission (CPUC), the efficiency standards are saving over 5,700 GWh per year. The CPUC estimates this as the equivalent of taking 600,000 California households off the grid and saving 356,000 tons of CO2 emission.

Moreover, California's efficiency programs have been positive for job growth and the economy. One result of the policy push has been the development of a robust energy efficiency market, with over 5,000 companies offering efficiency services across the state.

California's 30 years of energy efficiency initiatives offer significant lessons and incentives for policy makers and industry participants in Chile. And while efficiency does have a financial cost, energy can still be saved more cheaply than it can be produced, as the California example demonstrates.

California can also inform efforts in Chile on how to better communicate energy efficiency to a broader audience. Complex policy initiatives require a sophisticated communication strategy to help the general public better understand how energy savings translate to lower energy bills and economic opportunities.

Figure 2: California and US Electricity Consumption Per Capita



Sustaining Momentum

Chile's goal of increased energy efficiency is an admirable one and will bring the nation in line with global efforts and trends. Yet while some small programs are in place, much remains to be done. The Energy Agenda has just passed the one year mark and the priority for the Chilean government must be to enact the Energy Efficiency Law. The government is well aware that private sector buy in is essential for the successful implementation of the energy efficiency agenda. Examples such as California have demonstrated that support from the general public is also important.

Going forward, the government will need play an important role in developing the regulatory framework and incentive structure to promote and sustain its energy efficiency measures. Creating a thriving energy efficiency market takes time and must be supported by strong institutions and adequate budgets, with the knowledge that costs will be recouped in savings. Yet Chile is on the right path and has the benefit of learning from others as it seizes this opportunity.

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