

Local and Regional Economic Development Opportunities Related to the Implementation of the Sao Jose do Norte EBR Shipyard in Rio Grande do Sul

Report by Global Urban Development (GUD) to M. Stortti Business Consulting Group, Federation of Industries of Rio Grande do Sul (FIERGS), and Rio Grande do Sul Development Agency (AGDI)

December 2012

Introduction

Global Urban Development (GUD) was commissioned to supplement the M. Stortti Business Consulting Group report for FIERGS, *Evaluation of the Regional and Local Impacts due to the Implementation of the Sao Jose do Norte EBR Shipyard*. The Stortti team's detailed evaluation identifies many important economic, physical, social, and environmental impacts, and proposes policy guidelines and practical solutions addressing key challenges related to transportation, infrastructure, services, job training, housing, health, construction, environment, and other major issues. Their evaluation takes on wider significance in the context of M. Stortti's comprehensive statewide report, *Basic Guidelines of an Industrial Development Plan for the Ocean Industry in Rio Grande do Sul*.

As an additional contribution to the Stortti team's evaluation and recommendations, GUD's perspective is to review and analyze potential opportunities to generate broad-based and diversified economic, business, employment, and income growth, primarily in Sao Jose do Norte but also regionally, that can obtain strategic benefit from the major investments and new jobs that will come from building and operating the EBR Shipyard.

GUD proposes several key initiatives that can help enable Sao Jose do Norte and the region to become more prosperous, productive, and globally competitive through Metropolitan Economic Strategy, Sustainable Innovation, and Inclusive Prosperity.

This report was written by Dr. Marc A. Weiss, GUD Chairman and CEO, and Nancy J. Sedmak-Weiss, GUD Secretary-Treasurer and Chief Legal Officer. In conducting our research and analysis, GUD deeply appreciates the valuable information provided by M. Storti, and we are grateful to AGDI for arranging our three-day site visit and stakeholder meetings in Sao Jose do Norte, Rio Grande, and Pelotas. In the appendix to this report, we list people who participated in the stakeholder meetings, and we are profoundly grateful to everyone who generously took the time to meet with us.

We want to express special appreciation to Marco Franceschi, AGDI's Director for Infrastructure and Energy, who graciously served as our guide for the site visit and stakeholder meetings. We also thank many other AGDI senior staff for their experienced advice and collaborative assistance, particularly Marcus Coester, Ivan De Pellegrin, Moema Pereira Nunes, and Fernando Guimaraes. In addition, we thank Roberto dos Reis Alvarez, International Affairs Manager of the Brazilian Agency for Industrial Development (ABDI) in Brasilia, for helpful guidance. Finally, we are grateful to Dr. Elaine Yamashita Rodriguez, GUD Senior Fellow, for excellent research and analysis, and to Andreia Marin Martins, GUD Senior Fellow, for translating this report into Portuguese.

Executive Summary

The coming of the EBR Shipyard to Sao Jose do Norte poses many challenges and creates many opportunities. The M. Stortti Business Consulting Group discusses in detail many of these major challenges, and outlines various actions that are being taken, or can be taken, to plan for and invest in viable solutions. Global Urban Development's report describes key economic opportunities that can generate greater prosperity and quality of life by using the GUD framework for Metropolitan Economic Strategy, Sustainable Innovation, and Inclusive Prosperity. The opportunities highlighted are mainly focused on Sao Jose do Norte, but in several cases they also include Rio Grande, Pelotas, and other communities throughout the region.

GUD's proposed strategy emphasizes four major initiatives:

- *New Economic Opportunities in Commercial Fishing.*
- *New Economic Opportunities in Tourism, Culture, and Creative Industries.*
- *New Economic Opportunities in Wind Power and Green Technologies.*
- *New Economic Opportunities in "Zero Waste" and Cleantech Industries.*

Strategic Planning

GUD strongly concurs with the M. Stortti team's findings that Sao Jose do Norte will be experiencing significant impacts from the EBR Shipyard in terms of rapid growth and

change, and that extensive strategic planning is vitally needed to identify the key investments, improvements, and other public, private, and community actions.

Important questions must be addressed in a systematic and proactive way, with support from the State Government, and in some cases, also from the Federal Government.

Fortunately, many actions already are being planned or implemented, as summarized in both of the Stortti reports, involving the municipality, the region, the state, and including a series of mitigation measures to be funded and managed by EBR. Among the numerous potential and proposed priority interventions are:

- Widening and improving BR-101 and other major roads, including direct access to the EBR Shipyard for trucks and heavy vehicles bypassing the city center.
- Modernizing the terminals, fleet, and equipment for two-way passenger and motor vehicle ferry service between Sao Jose do Norte and Rio Grande to strengthen capacity, speed, and frequency of service.
- Preserving the physical and cultural heritage of the historic center, and revitalizing the historic waterfront area.
- Producing an adequate supply of new housing that is affordable, decent quality, accessibly located, and environmentally sustainable.
- Providing for sustainable solid waste management.
- Maintaining a sufficient supply of fresh and clean water for producers and consumers.

- Protecting the sand dunes, clean air, clean water, agricultural and recreational land, and the overall natural environment and ecosystem.
- Improving education and job skills training. In addition to organizations such as SENAI and SEBRAE providing workforce and entrepreneurial training, IFSUL (Federal Institute of Education, Science, and Technology) will be offering courses in Sao Jose do Norte and may locate a permanent facility there, which will be a major resource. Similarly, there is discussion about constructing a federal university campus in Sao Jose do Norte, most likely as a branch of the Federal University of Rio Grande (FURG). Such a strategic investment would become a very important local economic asset.
- Upgrading health care services.
- Increasing the frequency, quality, and accessibility of bus service and other public transportation, including a new bus terminal.
- Creating dedicated paths for bicycling.
- Expanding and modernizing infrastructure and utilities, including electric power generation, distribution of electricity and water, sanitary and storm sewage systems, and other vital needs.
- Investing in regional rail and water transportation.
- Conducting a feasibility study to construct a motor vehicle bridge or underwater tunnel between Sao Jose do Norte and Rio Grande.
- Coordinating local and regional land-use planning.

Even with these and many other ambitious efforts currently in process, Sao Jose do Norte and its regional neighbors need still more financial and technical resources and time to become fully prepared for the dramatic changes being driven by the growth of maritime industries. Large-scale investments in industrial and port facilities to build, transport, and service platforms, ships, and other heavy equipment directly related to offshore oil and gas exploration and drilling in Brazil, will continue bringing to Sao Jose do Norte, Rio Grande, and other nearby communities an accelerating influx of new jobs, population growth, higher land and building prices, greater traffic congestion, and many other substantial impacts.

Planning for and preparing proactively for such rapid transformation is extremely challenging even in the best of circumstances. It is both vital and urgent that more assistance is available as soon as possible to enable Sao Jose do Norte, Rio Grande, and the entire region to cost-effectively and sustainably guide and shape this difficult transition in order to maximize the economic, social, and environmental benefits, and minimize the potential harm.

In addition to the considerable information included in Stortti's impact analysis of the Sao Jose do Norte EBR Shipyard, the broader Stortti report on the Polo Naval in Rio Grande do Sul contains four detailed charts excellently summarizing some of the key municipal, regional, and state initiatives currently being proposed, planned, or implemented (Volume 2, pages 123-126).

Metropolitan Economic Strategy, Sustainable Innovation, and Inclusive Prosperity

Global Urban Development utilizes the Metropolitan Economic Strategy framework, advancing prosperity, innovation, technology, productivity, efficiency, competitiveness, creativity, sustainability, inclusiveness, and quality of life for communities, cities, regions, states, provinces, and nations throughout the world. Metropolitan Economic Strategy recognizes that in the new global economy, which is knowledge and information-based, and technology and communications-intensive, urban regions are more economically productive than rural areas because they combine the specialization of advanced skills with a wide diversity of many different types of advanced skills, utilizing modern transportation, telecommunications, and other vital institutions, technologies, infrastructure, and services.

Metropolitan Economic Strategy is proactive, requires good leadership and governance in order to succeed, and is based on coordinated and collaborative multi-stakeholder and multi-jurisdictional teamwork. Metropolitan Economic Strategy has two key elements: 1) building from strength — investing in the fundamental assets and activities that make people more productive and places more valuable; and 2) generating dynamism — promoting modern, globally competitive industry networks (also called clusters) that accelerate the pace of innovation and growth.

GUD's Chairman and CEO, Dr. Marc Weiss originally developed the Metropolitan Economic Strategy framework in the 1970s and early 1980s when he served as Deputy Director of the California Commission on Industrial Innovation, co-chaired by David

Packard, co-founder of HP, and Steve Jobs, co-founder of Apple. The purpose of this commission, created by Governor Jerry Brown, was to promote the growth of advanced technological innovation in Silicon Valley and throughout the State of California. A related initiative was the landmark 1981 economic strategy for the City of Berkeley (home of the University of California's main campus) to grow businesses, jobs, and incomes by promoting energy conservation and efficiency, and renewable energy production and distribution.

During the 1980s and 1990s, Dr. Weiss further refined this strategic framework as a Columbia University professor. Beginning in 1993, he redesigned Metropolitan Economic Strategy as a US national economic growth and urban investment policy for President Clinton, working with the US Department of Housing and Urban Development and the President's Council on Sustainable Development, and successfully applying Metropolitan Economic Strategy in Washington, DC, Metropolitan Baltimore, and other US cities and regions.

Of particularly significant impact was *The Economic Resurgence of Washington, DC: Citizens Plan for Prosperity in the 21st Century* in 1998. This included the highly successful sustainable economic development of NoMa (North of Massachusetts Avenue), which received international recognition as a best practice, and is summarized in GUD's 2008 report to the Organization for Economic Cooperation and Development (OECD) and the Government of Wales.

Based on this national model, GUD also developed a state-level version of Metropolitan Economic Strategy for the US National Governors Association in 2002, *State Policy Approaches to Promote Metropolitan Economic Strategy*.

Since 2001 GUD has helped spread Metropolitan Economic Strategy worldwide, working with the United Nations, World Bank, OECD, European Union, and in many countries, including Australia, Brazil, Canada, China, Czech Republic, India, Singapore, South Africa, Spain, Sweden, and the UK.

A key aspect of GUD's Metropolitan Economic Strategy framework is Sustainable Innovation, also called Sustainable Economic Development, Climate Prosperity, and Green Capitalism. Since 2007, GUD has worked on Sustainable Innovation for San Jose/Silicon Valley, San Antonio, Southwest Florida, Metropolitan Portland, Metropolitan Denver, and the State of Delaware.

During 2010-11, GUD developed an economic strategy, funded by the US Department of Energy, for Sarasota County, Florida to become a "Center for Innovation in Energy and Sustainability."

GUD helped organize an international conference on "Planning for Sustainable Economic Development Across the Americas," held in Curitiba during June 7-8, 2011, sponsored by the Brazil and US Governments and the Energy and Climate Partnership of the Americas. Also in 2011, GUD worked with the City of Sao Paulo on the "Cidade

Compacta” sustainable urban regeneration initiative. In 2012 GUD advised the Federation of Industries of Minas Gerais (FIEMG) in Belo Horizonte on Metropolitan Economic Strategy, and produced an October 2012 report on *Advanced Manufacturing and Sustainable Innovation: The Third Wave of Industrial and Urban Economic Growth for Minas Gerais*.

GUD has been working with the Rio Grande do Sul Development Agency (AGDI) since November 2011, when Dr. Weiss visited Porto Alegre to participate in the US-Brazil Innovation Learning Laboratory and an international meeting of the Global Federation of Competitiveness Councils. In February 2012, Ivan De Pellegrin and Moema Pereira Nunes from AGDI made a presentation at Columbia University in New York City on regional industrial policy and strategic sectors in Rio Grande do Sul, for the graduate course on “Global Urban Policy and Development” taught by Dr. Weiss, who is an Adjunct Professor of International and Public Affairs.

GUD organized an event on "Metropolitan Economic Strategy and Sustainable Economic Development in Brazil" at the UN World Urban Forum in Naples, Italy on September 5, 2012, at which Marcus Coester, AGDI President, was one of the featured speakers. In October 2012, Dr. Weiss gave a major presentation on Metropolitan Economic Strategy and Sustainable Innovation at the FIERGS Fifth Annual Innovation Congress in Porto Alegre.

GUD is applying our Metropolitan Economic Strategy, Sustainable Innovation, and Inclusive Prosperity framework in this report on *Local and Regional Economic Development Opportunities Related to the Implementation of the Sao Jose do Norte EBR Shipyard*. Our main focus in this report is on Sao Jose do Norte, though with some broader regional connections, especially with Rio Grande. We strongly recommend that local, regional, and state leadership actively collaborate in developing a comprehensive Metropolitan Economic Strategy for the maritime area of southeastern Rio Grande do Sul, in order to maximize prosperity, innovation, technology, productivity, efficiency, competitiveness, creativity, sustainability, inclusiveness, and quality of life for everyone and every community.

New Economic Opportunities in Commercial Fishing

One of the most important traditional livelihoods in Sao Jose do Norte is commercial fishing, especially for shrimp, croaker, mullet, catfish, silverside, flatfish, and blue crab. The total annual value of fisheries production in Sao Jose do Norte is more than R\$ 16 million, nearly 10 percent of the overall GDP and up to one-quarter of the agricultural GDP. This includes commercial fishing in coastal waters and in the Lagoa dos Patos, fish farming (mainly shrimp aquaculture), and both industrial-type large-scale fishing and more traditional artisanal-type small-scale fishing.

Recently two professors from FURG, Daniela Kalikoski and Marcelo Vasconcellos, conducted a major study, published by the UN Food and Agriculture Organization

(FAO), entitled *Case Study of the Technical, Socio-Economic, and Environmental Conditions of Small-Scale Fisheries in the Estuary of Patos Lagoon, Brazil*. This 2012 report is an in-depth description and analysis of the artisanal fishing community in the region, and it suggests that various organizational efforts can substantially increase fishing incomes and profits in Sao Jose do Norte by capturing a larger share of the total market value of the fish. Currently most of these small-scale artisans immediately sell their fresh fish catch to intermediaries, and the fish move through a value-added supply chain that substantially increases the final prices paid by consumers. Typically consumers pay up to 263 percent more to purchase fresh fish than the price initially paid by intermediaries to the original fishers for the same product.

According to the FURG/UN report, “One of the alternatives sought by fishers in the region to address problems in the commercialization of fish products is the organization of fishers’ associations and cooperatives. In addition, different strategies to decrease the high rate of incidence of intermediaries in commercialization have been implemented by the government both at municipal and federal levels.” Such strategies include support for “Fish Fairs” enabling small-scale fishers to sell directly to consumers, supplying institutional markets through “Zero Hunger” and other special programs, fish processing (especially for shrimp and blue crab), and additional methods. Further, these goals can be accomplished by modernizing the fleet of vessels and equipment, in order to reduce costs and improve efficiency and productivity. Finally, long-term issues of sustainability and health of fish stocks are currently being addressed through the innovative regional Forum of the Lagoa dos Patos.

The FURG/UN study concludes:

“Artisanal fisheries are characterized by minimal infrastructure for fish landing and conservation. Although this situation is well suited to the dominant type of commercialization, it is an important impediment to the development of alternative market strategies, which would increase economic returns for fishers and allow them to break away from the economic dependence on intermediaries and processors.”

“The bulk of fisheries production is marketed fresh. Fishers sell their catches to a different array of buyers, including intermediaries, local processors, associations and/or cooperatives and directly to consumers. Selling to local buyers and/or intermediaries is the dominant way of commercialization in the main fishing localities. The highest prices are fetched when selling directly to consumers, while little variation in prices was found among the other identified buyers. In recent years, efforts have been made to stimulate the organization of fishers’ associations and cooperatives as a way of promoting better and fairer options for fish commercialization. Although this mode of commercialization has a potential role to play in the future, it was found to have minor importance at the moment in the region.”

“Improving the role of fishers associations and cooperatives in the region will require strengthening community leadership, building technical capacity, improving and strengthening formal credit policies for local community-based organizations,

strengthening alternative markets for artisanal fisheries production (e.g., institutional markets and fish fairs), and finding ways to regulate the dominant mode of commercialization in the region centered on the intermediaries.” (italics added)

It may be possible to organize either existing or new fishers’ associations or cooperatives in Sao Jose do Norte that will be able to create a “brand” for marketing its fish products locally and regionally as distinctively higher quality, fresher, and tastier. Such a branding-based identity and marketing strategy can generate rising consumer demand and enable producers to obtain better prices and higher profits. Marketing cooperatives in the US have been very successful with such branding strategies, whether for dairy products through Land O’ Lakes, or for citrus products through Sunkist. Sao Jose do Norte previously had an agricultural cooperative, PROGASA (Produtos Gauchos S/A), and there may be some useful lessons to be learned from this experience, as well as from the two local fishers’ cooperatives, CECOV and COOPANORTE.

The artisanal fishing community in Sao Jose do Norte can work with SENAI, SEBRAE, IFSUL, and FURG to obtain business management and marketing assistance. It can also benefit from overall skills training and technical information and advice, including advanced production process ideas and methods, and innovative and sustainable new technologies.

Also, Sao Jose do Norte can organize a permanent and regular Fish Fair near the historic waterfront and ferry terminal. Indeed, the city has received a federal grant from the

Ministry of National Integration for this purpose. The Sao Jose do Norte Fish Fair can be a major vehicle for expanding local fisheries by drawing in many new consumers. In addition, it can become a major tourist attraction, supporting many spin-off retail and service businesses, hospitality, food and beverage, fisheries tours (similar to visiting wineries in Bento Goncalves), and even sports and recreational fishing.

Finally, the branding and marketing strategy can include major tie-ins with local and regional restaurants, such as Marco's. It could involve attracting international chefs to prepare special recipes cooking Sao Jose do Norte fish, also involving onions, rice, and other local food. There can even be an annual international Fish Festival in the historic center, similar to the world-famous Garlic Festival in Gilroy, California.

New Economic Opportunities in Tourism, Culture, and Creative Industries

Sao Jose do Norte, with better transportation accessibility, can become a successful tourist destination. The city possesses many assets, including an ocean beach, a large waterfront landscape on Lagoa dos Patos, an historic city center, and a traditional fishing culture, among others.

With good planning, some renovation, and clear preservation guidelines, Sao Jose do Norte can become a showcase for 18th and 19th century Brazilian buildings and culture, of charming interest to visitors who are drawn to experiencing historical eras. The city center can become the home of a new Center for Gaucho Maritime Culture, which can

sponsor research, publications, conferences, exhibits, tours, lectures, and many other activities, perhaps as a branch of FURG.

In order to house such a center, it will be necessary to build and attract a support structure of hotels, restaurants, stores, services, galleries, cafes, and other related businesses.

There can even be a one-block area of the historic center that can be a replica of late 19th century Sao Jose do Norte, with pedestrians, bicycles, and horse-drawn carts, but no cars or trucks. Recently the city received grants from the Ministry of Cities and the Ministry of Tourism to improve the historic center, so things are already moving forward in the right direction.

The existence of this center, and the researchers and students it will attract, will serve as a catalyst spinning off a local industry of artists and cultural specialists that will provide a new creative spirit to the city's and region's future economy of Sustainable Innovation. Generating creative talent, both locally and from elsewhere, will enable Sao Jose do Norte to attract and create many businesses that thrive and depend on workers and entrepreneurs with certain types of advanced skills.

The Center for Gaucho Maritime Culture should have a production studio for films, videos, and photography, both for internal use, and also available to be rented for commercial purposes. Sao Jose do Norte, both the historic center and the surrounding waterfront landscape, is a natural place to produce movies, television shows, and photographs, both for electronic and print media, including the Internet. The film studio

can help generate local communications media, performing arts, computer graphics, and related visual entertainment and digital media. For example, the 2004 Brazilian motion picture “O Gato” was filmed in Sao Jose do Norte. It is a good example of future opportunities.

Sao Jose do Norte also offers the potential of nature-oriented ecotourism, from watching birds to observing sea lions. It can do particularly well with recreational tourism involving a wide range of sports and recreational activities, including boating, fishing, swimming, windsurfing, running, camping, and much more. It could be the home of a marathon, a regatta, a beach volleyball tournament, a bicycle race, or even a triathlon. One current example is Travessia a Nado, the annual swimmer’s race across the channel to Rio Grande. Some of these activities may require improvements in land and water access to the Praia do Mar Grosso, along with more overnight accommodations near the beach for short-term visitors.

In Stortti’s statewide Polo Naval report, there is considerable discussion of increasing industrial cargo and commercial freight transportation by ships and barges in the inland waterways of Rio Grande do Sul, from Rio Grande to Porto Alegre and up the Jacui River to Charqueadas. These are very important strategic economic investments.

Another key investment might be in passenger transportation along the inland waterways, more focused on marketing to recreational users and tourists than for daily commerce. For example, there could be high-speed ferries between Pelotas and Sao Jose do Norte,

perhaps eventually with daily service both ways. Similarly, there could be weekend ferry service between Porto Alegre and Sao Jose do Norte, complete with entertainment, food, beverages, and souvenirs. For either or both of these water transportation services to commercially succeed, it will be vital to renovate and improve the ferry terminal in Sao Jose do Norte to make it much more inviting for visitors and tourists.

New Economic Opportunities in Wind Power and Green Technologies

Sao Jose do Norte, and the surrounding region, is well situated to become a major wind power center. The city has sufficient land available to install a large number of wind turbines that can generate a substantial amount of electrical energy. This land-based wind power is much less expensive and more cost-effective than offshore wind energy generation and transmission, yet still benefiting from its close proximity to the high wind velocity coming from the ocean.

Currently EPCOR Energia will be investing more than R\$ 300 million to install 40 wind turbines on 20 properties in Sao Jose do Norte, which will generate 80 megawatts of electric power, far more than the five megawatts currently consumed within the city. This project will be completed in 2014, and the electricity will be transmitted through the National Interconnected System (SIN). In addition, Ventos do Atlantico plans to build a wind energy farm that will generate nearly one gigawatt of electric power and create 500 jobs. Both of these major projects are complemented by an R\$ 400 million wind turbine

installation by Odebrecht to produce over 100 megawatts of renewable energy near Cassino.

Clearly wind power is gaining considerable momentum in southeastern Rio Grande do Sul, fulfilling the vision of Brazil's President Dilma Rousseff, dating back a decade ago when she served as Rio Grande do Sul's Secretary of Energy, Mines, and Communications, as exemplified by the 2002 *Rio Grande do Sul Wind Power Atlas*. According to AGDI's 2012 publication, *Wind Power in Rio Grande do Sul*, "Wind Power is one of the priority sectors of the Industrial Policy launched by the State Government." Businesses involved in the supply chain for wind turbine production, as well as in the operational side of maintenance, repair, and related services, can become significant drivers of the local, regional, and state economy.

Sao Jose do Norte can move boldly forward into the 21st century and become a leader in Sustainable Innovation by maximizing the potential of wind power, both by providing low-cost renewable electricity to EBR and other industrial, commercial, and residential users, and by building a state-of-the-art distribution system. This will involve working with CEEE and other entities to construct a modern underground Smart Grid, including "smart metering" to promote conservation and efficiency. It should also include laying underground broadband cable for high-speed and high-volume Internet access. The combination of wind power and broadband will help attract many new entrepreneurs, investors, and skilled professionals, strengthening Sao Jose do Norte's fundamental assets for diversified, balanced, and dynamic economic growth.

Sao Jose do Norte can work with FURG to promote research on renewable energy from the Atlantic Ocean, which could become a major source of new technologies based on Sustainable Innovation. In addition to wind, such research and development can focus on various forms of tidal and wave power, on geothermal, and on types of biomass energy from algae and other organisms. These and other initiatives can become part of the ambitious agenda of FURG's OceanTec Technology Park, and OceanTec could locate some of its research activities at a new campus in Sao Jose do Norte. There also can be experiments with decentralized distributed energy from wind turbines, large-scale use of solar-powered hot water heaters and solar photovoltaic cells on buildings, and innovations in batteries and electricity storage capacity to supplement the intermittent nature of prevailing winds.

New Economic Opportunities in “Zero Waste” and Cleantech Industries

The EBR Shipyard has presented Sao Jose do Norte with an opportunity to establish itself as a dynamic center for Sustainable Innovation. According to its own brochure, EBR is committed to valuing “sustainability and respect for the environment” and will seek to obtain LEED (Leadership in Energy and Environmental Design) Certification from the US Green Building Council for the construction of the EBR Shipyard at Sao Jose do Norte. Receiving LEED Certification means that the buildings and operations of the EBR Shipyard will be designed to conserve and more efficiently use energy, water, and

other resources, to reduce harmful ecological impacts, including greenhouse gas emissions, and to recycle and reuse materials and resources as much as possible.

City officials can work with EBR to promote Zero Waste. Under this concept every output, instead of being treated and disposed of as waste, can be recycled as a useful input for another production process or product, replicating the continuous cycles of nature, where “waste” is actually “food” or “fuel” for some other living organism. The best description of this approach in a modern advanced industrial and technological context is the international best-selling book, *Cradle to Cradle: Remaking the Way We Make Things* by William McDonough and Michael Braungart. Many corporations are following this model, as described by the late Ray Anderson, a very successful CEO, in Chapter 5 (“Zero Waste: The First Face of Mount Sustainability”) of his 2009 autobiographical masterpiece, *Confessions of a Radical Industrialist: Profits, People, Purpose – Doing Business by Respecting the Earth*.

It will be possible for EBR to institute a Zero Waste policy to drastically reduce its industrial waste and save a great deal of money. Ray Anderson’s Interface Corporation saved \$405 million through its Zero Waste program. DuPont, a much larger enterprise, saved several billion dollars by becoming more sustainable. Because EBR is part of the Port of Rio Grande, the entire Port can participate in this Zero Waste initiative, including the Ecovix-Engevix and Quip Shipyards, future shipyards (such as Wilson, Sons), and the many industrial and agricultural export companies located near the Port and Superport. It

can also include companies in EBR's supply chain and in the supply chains of the Port and the other shipyards.

Sao Jose do Norte's government currently is working on a solid waste management and disposal plan, with the help of Metroplan and other state agencies. This strategic planning process can serve as the beginning of developing a Zero Waste policy, both in more sustainable initial utilization of materials and resources, and in their extensive recycling and reuse. The beauty of this sustainable approach is that it saves money for companies, households, and governments, and more importantly, it generates new activities that expand local businesses, increase jobs, and raise incomes.

By creating a Zero Waste initiative, Sao Jose do Norte can attract international investment and talent from entrepreneurs and professionals with innovative ideas and technological solutions for new methods of production in a wide variety of industrial, commercial, and residential fields, including metal-mechanics, electrical-electronics, chemicals, and many other technological, engineering, and scientific processes. The EBR Shipyard can literally become a world leader in Sustainable Innovation and help put Sao Jose do Norte, Rio Grande, and the entire region on the global map as a cutting-edge international magnet for cleantech (clean technology) and green businesses, industries, products, and services.

Given the commitment by Petrobras to sustainability, and the prospective contracting relationship of EBR to Petrobras, a successful Zero Waste initiative may actually help

EBR, and other local shipyard businesses, to obtain new contracts with Petrobras for building ships, platforms and related heavy equipment. Zero Waste can enable EBR and other local firms to increase revenues and market share by expanding business with Petrobras, and potentially also with other large customers. In addition, if EBR, Ecovix-Engevix, Quip, and other companies are actively reducing greenhouse gas emissions, they might be able to improve profitability and enhance financial resources by selling credits in international carbon markets.

Zero Waste can strengthen the bottom line of existing companies. And, Silicon Valley-style, Zero Waste can help incubate and accelerate start-ups and fast-growing small and medium-sized companies that invent and innovate new industrial waste reduction and reuse processes and technologies. FURG, IFSUL, FIERGS, SENAI, SEBRAE, and many other key institutions could play active roles in a Zero Waste initiative, including PROAMB.

Zero Waste is a good image for a dynamic and competitive economy, because it also includes not wasting people. Many low-income families and communities already support their economic livelihoods by collecting and selling recyclable materials. There are many new and creative ways that a broad base of the population can actively be involved in the workforce and business supply chains that will economically benefit from a Zero Waste initiative.

Conclusion

This GUD report offers a future direction for *Local and Regional Economic Development Opportunities Related to the Implementation of the Sao Jose do Norte EBR Shipyard*.

Following GUD's recommended path forward can help enable Sao Jose do Norte and the entire region to achieve greater prosperity, innovation, technology, productivity, efficiency, competitiveness, creativity, sustainability, inclusiveness, and quality of life.

Sao Jose do Norte can best obtain substantial long-term benefits from the EBR Shipyard by promoting a balanced, diversified, modern, and dynamic economy, through four major initiatives:

- *New Economic Opportunities in Commercial Fishing.*
- *New Economic Opportunities in Tourism, Culture, and Creative Industries.*
- *New Economic Opportunities in Wind Power and Green Technologies.*
- *New Economic Opportunities in "Zero Waste" and Cleantech Industries.*

Appendix

STAKEHOLDER MEETINGS

October-November 2012

Sao Jose do Norte

Vicente Ferrari, Mayor, Municipality of Sao Jose do Norte

Zeny Oliveira, Mayor-Elect, Municipality of Sao Jose do Norte

Marisa Excelsior, Secretary, Department of Municipal Works and Urbanism,
Municipality of Sao Jose do Norte

Juliana de Castro, General Secretariat of Government, Municipality of Sao Jose do Norte

Liane Arndt, Supervisor of Administrative Services, Municipal Bureau of Tourism and
Promotions, Municipality of Sao Jose do Norte

Rogério Fernandes de Oliveira, Municipal Bureau of Agriculture and Fisheries,
Municipality of Sao Jose do Norte

Gastao Tertuliano da Costa Sa, Sao Jose do Norte Business Relations Director,
Commercial Association of Rio Grande (CDL)

Alexandre Azevedo, President, Ventos do Atlantico

Aureliano Nobrega, Junior Geologist, Rio Grande Mineracao S/A

Rio Grande

Alexandre Lindenmeyer, State Representative, State of Rio Grande do Sul, and Mayor-
Elect, Municipality of Rio Grande

Gilberto Machado do Pinho, Municipal Secretary for Extraordinary Affairs, Municipality
of Rio Grande

Gustavo Garima, Chief of Staff, Office of the Superintendent, Port of Rio Grande

Darci Antonio Tartari, Planning Division Manager, Port of Rio Grande

Marcelo Cordeiro Couto, Office of the Superintendent, Port of Rio Grande

Leonardo Pereira Maurano, Office of the Superintendent, Port of Rio Grande

Joao Carlos Brahm Cousin, Rector and Professor, Federal University of Rio Grande (FURG)

Ernesto Luiz Casares Pinto, Vice-Rector and Professor, Federal University of Rio Grande (FURG)

Jose H Muelbert, Professor, Center for Biological Oceanography, Institute of Oceanography, Federal University of Rio Grande (FURG)

Pelotas

Adolfo Antonio Fetter Jr., Mayor, Municipality of Pelotas

Darci de Avila Ferreira, Superintendent of Popular Economy, Municipality of Pelotas

Cassio Rene Furtado, Superintendent of Education, Municipality of Pelotas

Manuel De Souza Maia, Director, Agency for the Development of the Lagoa Mirim Basin (ALM)

Paulo Roberto Cabana Guterres, Professor and Director of the Polytechnic Center, Catholic University of Pelotas (UCPEL)

Jairo Halpern, Professor and Advisor to Rector, Catholic University of Pelotas (UCPEL)

Janette Otte, Pro-Rector of Institutional Development, Federal Institute of Education, Science, and Technology (IFSUL)

Marcus Andre Betemps Vaz da Silva, Professor and Pro-Rector of Extension, Federal Institute of Education, Science, and Technology (IFSUL)

Porto Alegre

Marcus Coester, President, AGDI

Ivan De Pellegrin, Director of Planning, Programs and Funding, AGDI

Marco Franceschi, Director for Infrastructure and Energy, AGDI

Moema Pereira Nunes, Deputy Director of Planning, Programs and Funding, AGDI

Fernando Guimaraes, Advisor to the Director of Planning, Programs and Funding, AGDI

Marcelo Lopes, CEO, BADESUL

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