WILEFKO PROJECT

ENERGY GENERATION
BY WAVE ENERGY DEVICES

AN INVESTMENT PROJECT ON
NON-CONVENTIONAL RENEWABLE ENERGY (NCRC)

Prepared by: WILEFKO

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DOCUMENT IDENTIFICATION

COMMERCIAL PROPOSAL CODE **PFW001**
SCOPE OF THIS DOCUMENT **EXPANSION PLAN OF BUSINESS OPERATIONS:** This document includes our investment plan for the next five years, (2015-2020), to introduce the Wilefko technology in the Chilean and global markets.
PREPARED FOR: **Company :** Contact:
REVIEWS

Version	Date	Status	Comments		Prepared by		Review by		Aprobed
B1	09-07-2015	Draft			EEC		CSD	JTA	
0	21-07-2015	Final			EEC		CSD		
1	14-08-2015	Final			CSD				

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Content

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EXECUTIVE SUMMARY

WILEFKO is a Chilean company founded in 2011, in order to exploit wave energy or wave energy available in seacoasts; it can become and be harvested as a new source of energy to power production processes or domestic consumption.

Wilefko technology described in this document is patented in 27 countries, including Chile. The development of this technology is the work of our professional team, today a multidisciplinary team of 26 professionals who have been working almost 4 years in the areas of design, basic engineering, mechanical engineering prototypes and pilot scale real size and testing of these devices at the sea, under real conditions.

In these 4 years, we have invested three years research with real sea trials, experience that we have been able to estimate the average annual energy output from a kilometer of typical Chilean coast beach is 175,000 MWh / year per 1 Km of coastline. Which is to have an installed capacity of 20 MW available from this source of inexhaustible and free energy that can be obtained night and day. This ability to harvest night indicates a great advantage over single sources that can generate only in daylight, for example.

In short, we seek to bring our technology proposal to Chile's energy matrix with this type of non-conventional renewable energy (NCRE). Our proposal is also fully exportable to other markets around the world who have access to beaches and coastal sites, as we will describe in detail herein.

It is estimated that the potential of non-conventional renewable energy in Chile by 2025 the market will reach **$ 8700 MMUS** with a demand of **23,000 GWh / Yrs**. NCRE is a market segment established by Law 20,698, enacted in 2013, that established that by 2025, 20% of energy injections must come from NCRE[1] means, therefore, the electrical system must meet a NCREs injection quota in their electrical systems.

[1] ERNC , Non-conventional renewable energy

SCOPE OF THIS DOCUMENT
Initial guiding document to potential customers and investors who wish to evaluate the development and commissioning of power generating plants obtained from ocean waves, called wave energy technology.

Wilefko expansion plan for the next five years considers five stages:

1) Opening of market with installation of pilot plants.
2) Sale of isolated power generation systems.
3) Sales of power plants within 1MW - 9 MW.
4) Energy and power sale contracts or PPA SPOT.
5) Licensing

I. WILEFKO SPA

1. Company profile

Wilefko is a "garage" company, as was HP, Apple, Disney, created by six founding members in order to develop technology for commercial exploitation of breaking wave energy, also known as wave power and cataloged within the NCRE (Non-Conventional Renewable Energies).
Formalized in 2013 as a joint stock company (SpA), with a registered capital of US $ 287,000 made by the Industrial Patent, trademark law, pecuniary contributions and person-hours valued of its founders.

1.1. Wilefko Spa Societary Structure

	Name	ID	nationality	participation percentage
1	Javier Ignacio Pozo Núñez	10.666.637-7	Chile	7,0%
2	Andrés Fuenzalida De Toro	13.252.874-8	Chile	2,0%
3	Claudio Hugo Sala Déboli	5.741.034-5	Chile	5,0%
4	Bárbara Valeska Castro Sánchez.	10.671.532-7	Chile	1,0%
5	Mauricio Hernán Egaña Castillo	10.585.151-0	Chile	1,0%
6	Eduardo Javier Egaña Castillo	10.585.123-5	Chile	84,0%

(Fig. 1, Wilefko SpA partners table)

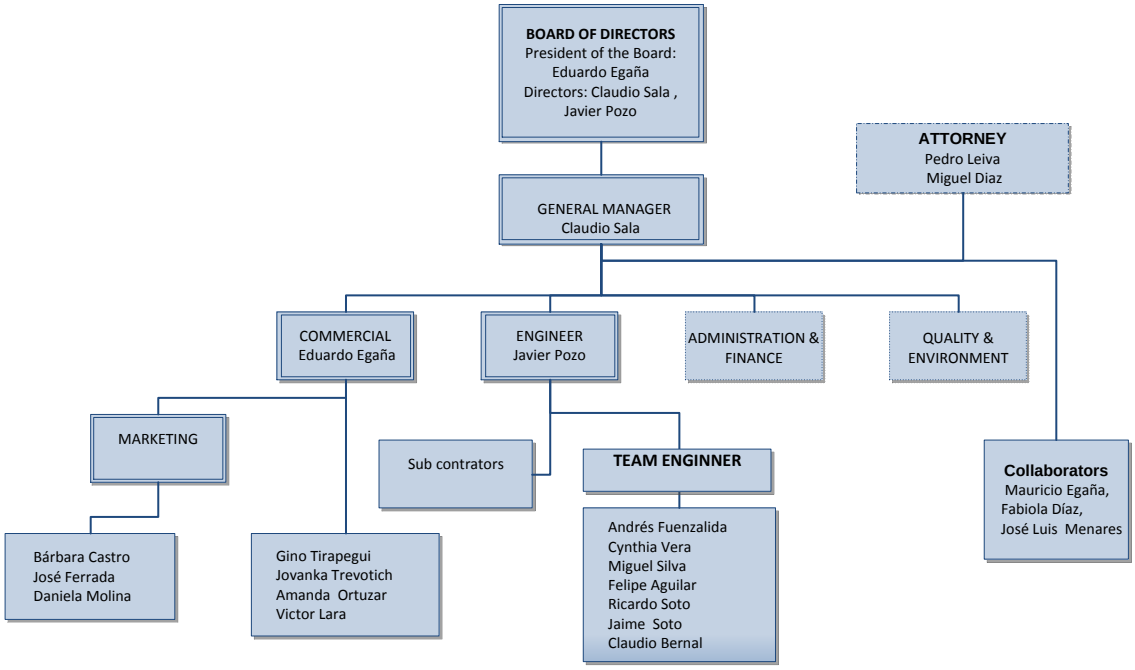
- **President of the Board:**
  - Eduardo Egaña Castillo
- **Board**
  - Javier Ignacio Pozo Núñez
  - Claudio Hugo Sala Déboli
  - Eduardo Javier Egaña Castillo
- **General Manager**
  - Claudio Hugo Sala Déboli
- **Legal representatives**
  - Claudio Hugo Sala Déboli
  - Eduardo Javier Egaña Castillo

The capacity of Mr. Eduardo Egaña Castillo and Claudio Sala Déboli to represent jointly **SPA** WILEFKO was registered by public deed dated April 17, 2013, signed before **Camilo Valenzuela** Notary of Santiago, Chile.

Business Name	Wilefko SpA
Unique Roll Tributary	76.299.674-K
Line of Business	ERNC Generation, investigation
Street	1765 Providencia, of 307, Providencia, Santiago, Chile
Jointly represented by	Claudio Sala & Eduardo Egaña
Date constitution	April 17, 2013
Mail	contacto@wilefko.com
Web	www.Wilefko.com

(Fig. 2, Legal information table, Wilefko SpA)

WILEFKO SpA Organization chart



(Fig. 3, Organization chart, key executives)

1.2. Professional profile and experience of main executives

EDUARDO EGAÑA, Computer Engineering at Universidad del Norte,

Diploma entrepreneur Universidad de Santiago, Chile. 17 years as owner/manager at DPA computer, creating and offering to the market, 16 different complex Systems, and electronic control equipment. It was pioneer in: 1) Integration of multiplatform system, 2) Developing multi-poll devices, 3) Developing a POS system based on touch-screens for Festival de Viña 4) Various products marking trends in the field of automation.

In 2011 invents and initiates the wave energy entrepreneurship project to generate energy from the sea, with the aim of contributing to clean energy. Formed a team of 18 people, including engineers and technicians, and was able to raise $ 300 of governments funds supported by CORFO INNOVO, an incubator of Universidad de Santiago, Chile.

Eduardo.egana@wilefko.com Phone : (56+9) 9884 1349

CLAUDIO SALA, Universidad Adolfo Ibáñez: MBA Executive (Management and Administration), Universidad de Chile: Civil Electrical. CIISA: System Engineer. Update seminars at Berkeley University (California) and Harvard University (Cambridge, MA.).

35 years of experience leading complex projects covering negotiation, monitoring and management of complex IT services. Relevant experience dealing with outsourced contracts with the largest IT providers from Chile, Brazil and Argentina. Extensive experience leading teams of IT in these countries, more specific treatment in Brazil, Peru and Colombia. It uses the expertise as leverage IT Business Development with strong focus to work with highly motivated teams (Human Capital Approach).

Extensive experience in complex environments internal and external political management, in hostile environments and adverse scenarios for the implementation of corporate technological changes of high impact on the organization.

Today, works as leader and responsible for the introduction of innovation environments in one of the larger universities of Chile, creating there an innovative eco-system of co-working, at Universidad San Sebastian, Santiago, Chile (30.000 students)

Claudio.sala@wilefko.com Phone : (56+9) 6728 9794

JAVIER POZO, Mechanical Civil Engineer, Universidad de Santiago.
Ten years of experience in engineering projects, he has participated as Mechanical/Piping Engineer, PDMS administrator/coordinator and 3D specialist, in steps of basic feasibility of complex projects; basic and detail engineering of projects in the fields of Bigger Mining and Pulp Camps. Strong experience EPCM mining participating in Copper, Gold and Nickel mining camps in the areas of Material Handling, Process Plant, Port-Site, and Plant Lixiaviación SX. Experience in software management with broad domain of Aveva PDMS, Navisworks Autodesk, Aveva Review, Bentley AutoPIPE, 2D AutoCad and MicroStation V8. Experience in calculation and modeling of parts and mechanical assemblies with advanced mechanical design software 3D (Autodesk Inventor Pro, Solidworks and Solid Edge). Current job: AMEC, Manager and Coordinator PDMS 3D.

CYNTHIA VERA, Mechanical Civil Engineer, Universidad de Santiago.

Eight years of Mechanical Engineering experience in Engineering: pulp and paper, smelting and concentrators of copper mining; and Field experience as piping field engineer in the construction of a concentrator plant.

Performed in various technical, supervisory assignments in mechanical and piping systems design, engineering development, construction and start-up projects, work with international standards as ASME, AWS, ASTM, ANSI, ISO, API, BS, EN, DIN, AWWA, Etc. Good interpersonal skills and experience of working in multi-international project teams. Actual position: Bechtel Chile and Fluor Daniels.

ANDRES FUENZALIDA, Industrial Civil Engineer, Universidad Diego Portales.

Ten years of experience, strong experience in the electric energy and thermal fluids fields, with experience in the areas of renewable energy, thermodynamics, electrical laws, national electricity market as energy efficiency consultant (National Standards Institute). Consultant and project manager at Energy Efficiency validated by INN. Innovation Award 2007 by Dalkia International, Paris - France 2007, for variable business model in selling industrial steam and dairy products. Achieving returns of over 15%. Development machine to generate electricity from the ocean waves. Actual position: FUENZALIDA And SANTIS LTDA.

MIGUEL SILVA CORTEZ, Industrial Mechanical Technician Universidad Técnica Del Estado.

35 years of experience Extensive experience in maintenance of equipment and machinery in Transportation, Mining and Fishing Fleet and marine vessels. Experience in mining camps at BHP Billiton (Minera Escondida Leeds), Superintendent of Maintenance Workshops Mina. (15 years)

FELIPE AGUILAR, (PHD) Physic Engineer Universidad de Santiago. e

Six years of experience Doctor, Ecole Normale Supérieure de Lyon, Academic and Investigator at Universidad de Santiago, Chile

1.3. Strategic partners teams

Strategic work areas are integrated by professional consultants and associated companies for the execution of each project.

Company	Areas
R&Q ingeniería	supplies engineering & construction of plant
Asmar	supplies engineering and manufacturing of device
Vidaware SPA	supplies Electrónic Engineering
R&Q ingeniería	supplies Electric Engineering
Bentos o Insub	Mounting divice and Oceanic study

(Fig. 4, Strategic Partners table)

1.4. Sponsorships and Partnerships

CORFO | Corporación de Fomento de la Producción

CORFO is an executing agency of government policies in the field of entrepreneurship and innovation, through tools and instruments compatible with the main guidelines of a social market economy, creating the conditions for building a society of opportunity. We were able to raise Corfo financing for US $ 300.000, in 2012, and it was approved in less than 45 days.

INNOVO USACH, Center for Innovation and Technology Transfer

The University of Santiago, Chile created in 2006 INNOVO-USACH. It´s main challenge is the consolidation in the areas of bonding, promoting a culture of entrepreneurship and innovation in our country. The lines of action that will achieve the objectives are technology transfer and business incubation through the development of projects and businesses that strengthen the Entrepreneurship and linking universities and companies. Therefore INNOVO USACH is a platform of specialized services designed to manage, link and disseminate applied research projects, technological innovations and business, adding value to the Enterprise

INCUBA2

Incuba2 Corporation is a nonprofit organization whose goal is to promote and develop innovation and entrepreneurship in the Atacama Desert, allowing improving the quality of life of its inhabitants and sustainability of northern Chile.

Founded in 2005, the result of a strategic alliance between Codelco, Regional Government, University of Antofagasta, National Association of Copper Supervisors and Catholic University of the North, Corporation Incuba2 has specialized in providing services to generate innovation and entrepreneurship in the Desert Atacama, supporting people and companies in the regions of Arica and Parinacota, Tarapaca, Antofagasta and Atacama.

CLUB OF INNOVATION

It is an innovation ecosystem where partners find inspiration, tools and allies to generate high-impact sustainable innovation through the connection, collaboration and co-creation.

1.5. Our technology Intellectual Property

We have exclusive rights to the technology on 27 countries by the year 2031. An application for a patent in Chile (CL2011 / 02154); and a PCT application (WO / 2013/029195). In April 2014, we initiated national phase in the United States, European Community, Canada and Australia. The two international searches have signed novelty, inventive step and industrial application.

2. Wilefko actual status

In April 2015, we began the commercial phase with products aimed at the sale of single low power equipment 100KW. With the following products

- Electricity: mining pilot or electricity to villages.
- Desalination of seawater by reverse filter osmosis, up to 223 M3 per single device.
- Lighting or shoreline of 1500 m, 67 posts, 180 W each
- Compressed air supply or for industrial processes

2.1. Results of business management in three months

As a result of the commercial activities, have opened two economic sectors in Chile, totaling US $ 11.4 MM with potential businesses at different stages of progress, it is estimated closure before the second semester of 2016.
The three companies have presented interest in technology Wilefko correspond to the three largest mining companies in Chile. It is a unique opportunity for potential growth of Wilefko. The pilots will aim to explore the technical feasibility of the technology, if the expected results are satisfactory open new business opportunities for the sale of energy or plant over 20 MW.

Client	Status	K US$	LCOE	Descripcion
BHP Billiton, Coloso Plant	90%	800	0,1033	Pilot 500 KW, final projection to power 13 MW
COLDECO, División Radomiro Tomic,	50%	500	0,1574	Pilot 500 KW, final projection to power 20 MW
ANTOFAGASTA MINERALS, Centinela	75%	6 000	0,0978	Power 2 MW,
Cityglobal , otra minera	10%			Distributor agreement
Municipalidad La ligua	10%	300		Water Desalinization
Municipalidad Zapallar	10%	300		Electric secondary support
Gore Maule	25%	1200		solidarity fund
Municipalidad Curepto	25%	600		Water Desalinization
Municipalidad Pelluhue	25%	600		Water Desalinization
Municipalidad Licanten	25%	600		Water Desalinization
Municipalidad Vichuquen	25%	600		Water Desalinization

Porcentaje	10%	25%	50%	75%	90%	100%
status	prospect	presentation	evaluation	negotiation	close	Purchase Orders

(Fig. 5, Potential clients table)

Business Models offered by Project Wilefko

Wilefko SpA offers to investors interested in our project, 4 alternative of business:

2.2. Sale of small-scale equipment

Participate in the development, manufacture and commissioning of individual devices, with their maintenance contracts for installations with a capacity below 1MW. Revenues will be given by:

- **Electricity Generation:** income from sale and installation of isolated equipment on the waterfront to power small communities. Client: the state through its municipalities and Regional Government.
- **Seawater desalination:** using reverse osmosis filter, detached to our device then pumping seawater, based on our engine powered by our technology wave paddle. Revenues from the sale and installation of equipment isolated on the waterfront, capable of delivering up to 220 cubic meters per day (m3 / day) of fresh water obtained from each wave train. This solution is designed for small communities, with the state acquires the customer for these isolated communities, through municipalities and the Regional Government.

- **Lighting of coastline:** to provide electricity to 67 poles of 180W each, which totaled approximately illuminate an area of 1,500 meters in length, each wave train used to capture the energy of the sea. The incomes generated by the sale and installation of insulated equipment, purchased by municipalities and companies located on the waterfront, with the possibility of injecting the surplus to the grid by NetBilling contracts.
- **Compressed air supply or for industrial processes**: income from the sale and installation of insulated equipment, used for supplying compressed air to industrial processes. Aimed at customers operating tasks of ports and operating company on the waterfront.

2.3. Monomonic Energy

Energy sales business and long-term power, with an installed capacity from 3 MW. In this business model, the concept is oriented for generating companies that need to comply with a share of NCRE generation, as defined in the law 20/25. You can also apply to medium to large enterprises requiring overnight supply from a renewable energy source, referred as free clients.
Revenues in this case comes form:

- Sale of electricity at spot price.
- Sale of electric power, a power node price.
- Sale of energy PPA Power.
- Sale of carbon credits associated with CDM.
- Income from the reduction of CO2 emissions attributable to the office of the NCRE and efficient co-generation technology.
- Credit Sale URE (if the energy source is URE). Contribution to NCRE Law.
-

2.4. Plant Sale from 9 MW

Oriented to generation companies or investment funds interested in investing in new sources of renewable energy.

Complementary applications

- Desalination of seawater
- Backup of critical system.
- Compressed air supply.
- Pumping seawater.

2.5. Licensing

Divest part or all of the rights to use the technology in countries other than Chile. This business model is aimed at potential developers, utilities, states or investment funds interested in commercially exploit the technology, specially designed for use in the United States, Canada, Australia and the European Union, to be relevant markets and where we have protection patent and commercial rights.

Products:

- Franchise.
- Royalty by MW built.
- Royalty per MW produced.
- Sale of industrial patent rights.

3. Strategic Plan

Wilefko defined a strategic plan based on three development axes (see Fig. 6):

AXIS No. 1: Development of isolated systems.

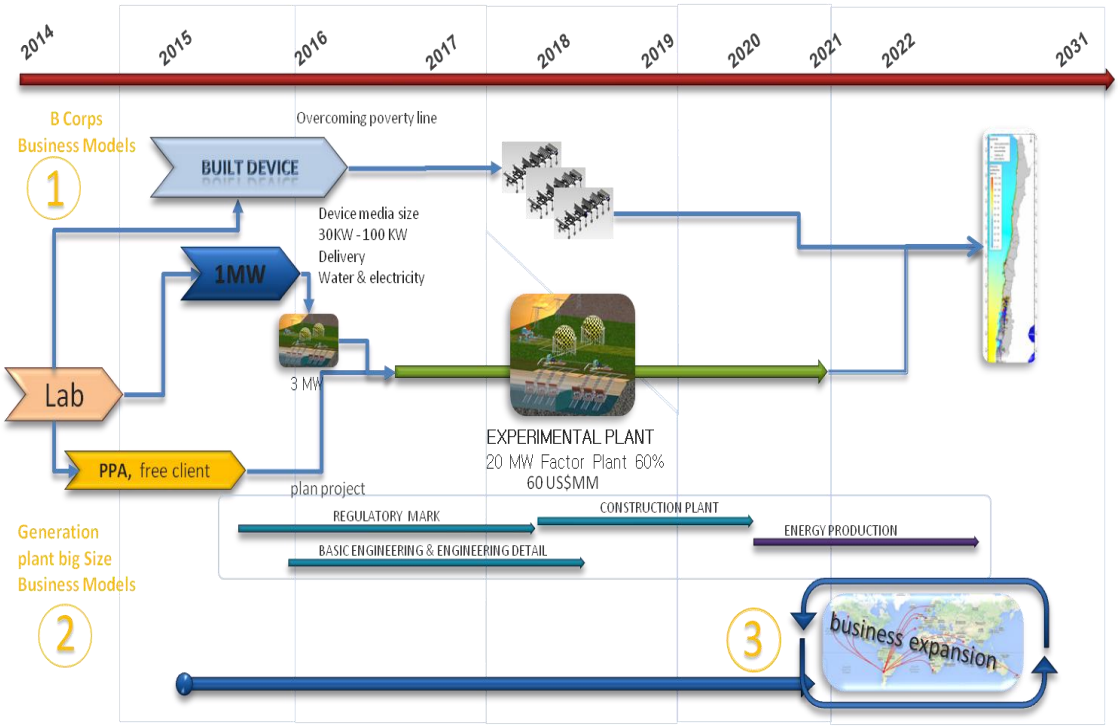
- We will operate on this axis, as a type B company, which seeks to meet the needs of water and electricity to isolated areas or islands of Chile, with limited access to energy, also get a very high cost.
- Development of pilot plants for mining, which seeks to explore the feasibility of obtaining energy NCRE for Chile's main industry.

AXIS 2: Large-scale projects of 1 MW

- Construction 1-3 MW technology maturity stage for large projects.
- Plants of 9 MW, final stage large construction projects

AXIS No. 3: Licensing.

- Release for construction of plants using our technology hub that can develop in parallel with the other 2 axes strategic o development.



(Fig. 6, Plan diagram

4. Commercial Plan

4.1. General Aspects

The United Nations, in its mitigation plan by global warming have called on their members to incorporate into their energy matrix, at least a 20% share of renewable energies by 2020. By 2050, states the global population will reach 9000 million people and OECD demand 16 tera watt hours of electricity annually.
Chile meanwhile, in 2013 changed its legislation to modify the energy matrix by 2025, committing a market share of 20% NCREs.

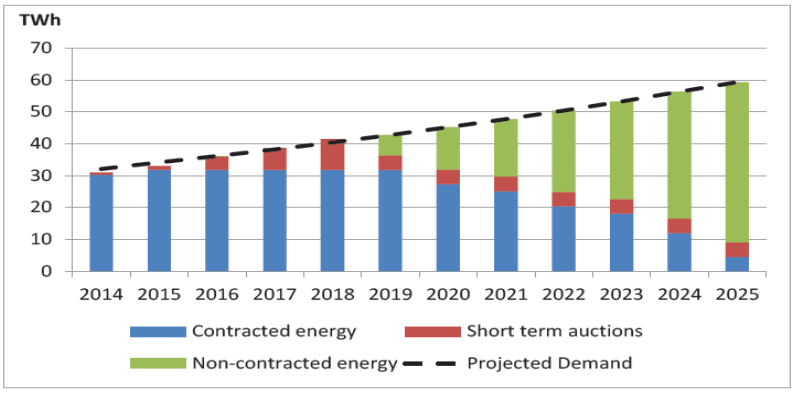


Fig 7, Source: Enersis, Systep, April 2014

Then it opens in our country, an opportunity to unmet 23,000 GWh annually, with a market size of MUS $ 8,700. Wilefko seeks a stake marking on the unmet demand of 3%, equivalent to an installed capacity of 80 MW.

4.2. The mining sector, an opportunity for our outstanding technology

We detected two very important issues that affect opportunities for growth and development of existing mining projects or opening of new mines: the lack of water and high energy needs at low prices less competitive for these mining projects. Both requirements have been part of the crippling factors of investment in new mining project, whose detention amounts are estimated at US $ 43 000 MM.

According to studies by the Society of Manufacturing Promotion, SOFOFA, 2014, the suspension or postponement of these investments resulted from the prosecution initiatives, energy shortages, and the 'uncertainty' legal and environmental regulation. Diego Fernandez CEO of Antofagasta Mineral said 2013, (fig.8), "If the market cannot have an answer to our needs more energy, the answer will come to us and invest in energy, although it is our vocation ".

(fig. 8, source newspaper El Mercurio)

Moreover, Chile faces the driest decade of the last 150 years, with clear water shortages, affecting over 1.5 million people in 206 municipalities. In mining, water is vital for their production processes, which directly affects on production costs and on levels of investment.

Meanwhile, the issue of energy, Chile has one of the most expensive energy region and the lack of new power projects, has paralyzed the mining investment.

5. Products offered by WILEFKO

In these 4 years of research and development projects and projects studied in various parts of the country, we have defined a list of products and services Wilefko offer, according to needs identified in the Chilean market explored to date.

Products	US$
Isolated Systems for Mining	
Pre-feasibility study	$ 123.827
100 KW device	$ 511.679
500 KW device	$ 818.300
Pilot plant for large mining, 100 – 200 KW	$ 624.040
Pilot devices for large mining, 500 KW	$ 930.661
Isolated Systems for NO Mining	
Pre-feasibility study	$ 90.403
Coastal edge lightning equipment	$ 1.052.485
100 KW device	$ 221.742
Postal electric project with public LED luminaries	$ 300.000
Equipment for seawater desalination	$ 530.742
100 KW device	$ 221.742
Reverse osmosis filter module 220 m3 /day	$ 309.000
100 KW device	$ 221.742
Services	
Maintenance contract	16% de la investment
Plant construction	
Generating plant1-3 MW, MW built price	$ 3.000.000
Generating plant> 9 MW, MW built price	$ 3.000.000
Energy sales	
Spot market power sales projection of MW, 2020	$ 158[2]
PPA energy sales projection of MWH, 2020	$ 115
Licensing	
Produced MW	$ 2
Patent sale	$ -
Franchise	$ -
Built MW	5% de la investment

[2] Reference average price variation projected 2030

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II. FINANCIAL PLAN

1. Required investments

The annual investment or Line of credit[3] required for the next six years, is as follows:

Year	Investment US$	Type	Return
2015-S1	$ 500.000	Loan	2017
2015-S2	$ 1.037.818	Loan	2017
2016	$ 4.500.000	Loan	2020
2017	$ -		
2018	$ 110.425.950	Investment	10 years
2019	$ -		
2020	$ 6.749.865	Loan	2024
Total LOC	**$ 123.213.633**		

(Fig. 9, Investment chart)

These figures are broken down into the following activities within each period indicated in the above table:

Description 2015-S1, preliminary process

- Financing commercial exploration 2015
- Basic engineering of detail for a wave train
- Making a measuring device (undimensor)
- Human Resources, Business Development Plan
- Advertising and promotion
- Study of local electricity markets

Description 2015-S2, in order shopping for isolated systems

- Advertising and promotion
- Basic engineering of detail for a wave train
- Basic and detail engineering plant, for an isolated system
- Study oceanographic customers
- Making Waves trains
- Mismatch box, pre-feasibility study
- Mismatch box, project for the mining sector
- Mismatch drawer, per project for the municipal sector
- Investment in equipment and tools
- Human Resources: commercial and operational
- Purchase advisory services

[3] Line of credit, LOC

Description 2016, with orders to purchase Sentinel

- Mismatch box, pre-feasibility study of the project of Puerto Sentinel
- Mismatch box, previous studies for the Port Sentry project
- Previous studies in Puerto Sentinel
- Basic engineering and detail of the project for Puerto Sentinel
- Investment in equipment and tools
- Making waves trains to Puerto Sentinel
- Purchase equipment Reverse Osmosis
- Human, commercial and operational resources
- Engineering study own factory mounting
- Mounting own factory
- Purchase advisory services

Description 2017, previous studies 2 floors 20MW

- Human, commercial and operational resources
- Technical feasibility study for 20 MW plant
- Financing commercial exploration of PPAs
- Spot Market
- Advertising and promotion for the sale of plants
- Studies sectoral permits to plant 20 MW
- Financing plan for internationalization
- Purchase advisory services

Description 2018 start construction of two plants of 20 MW

- Conceptual, basic and detailed engineering plant 20 MW
- Purchase of coastal land
- Processing of sectorial permits
- commercial and operational Human Resources
- Purchase advisory services

Description 2019, previous studies MW plants

- Commercial and operational Human Resource
- Advertising and promotion for the sale
- Pre-feasibility studies and feasibility MW plant
- Purchase advisory services

Description 2020 constructions start selling plants.

- Conceptual, basic and detailed engineering MW plant
- Purchase of land
- Human, commercial and operational Appeal
- Advertising and promotion for the sale of plants
- Purchase advisory services

2. Cash Flow

Cash Flow extract for the first 6 to 18 years.

US$ 620

	0 2015-S1	1 2015-S2	2 2016	3 2017	4 2018	5 2019	6 2020
SALDO INICIAL		$ 0	$ 226.643	$ 1.166.003	$ 4.763.740	$ 7.056.099	$ 65.393.775	$ 56.524.730
I TOTAL INGRESO		$ 0	$ 141.848	$ 3.851.108	$ 5.846.560	$ 9.509.145	$ 8.809.145	$ 10.519.145
I.1 NEGOCIOS ACTUALES 2015-2016	$ -	$ 141.848	$ 2.633.688	$ 2.883.906	$ 1.585.120	$ 1.585.120	$ 1.045.120
I.2 NEGOCIOS FUTUROS 2016-2032	$ -	$ -	$ 1.217.419	$ 2.962.654	$ 7.924.025	$ 7.224.025	$ 9.474.025
II TOTAL DE EGRESOS	$ 273.357	$ 240.306	$ 4.790.467	$ 864.548	$ 61.597.419	$ 17.678.189	$ 20.187.362
II.1 EGRESOS PARA PROYECTOS ACTUALES 2015-2016	$ 273.357	$ 240.306	$ 4.790.467	$ 864.548	$ 959.919	$ 1.542.674	$ 339.347
II.2 EGRESOS NEGOCIOS FUTUROS 2016-2032	$ -	$ -	$ -	$ -	$ 60.637.500	$ 16.135.515	$ 19.848.015
III MARGEN OPERATIVO	-$ 273.357	-$ 98.458	-$ 939.359	$ 4.982.012	-$ 52.088.275	-$ 8.869.045	-$ 9.668.217
IV ESTRUCTURA DE FINANCIAMIENTO	-$ 500.000	-$ 1.037.818	-$ 4.537.097	$ 2.689.653	-$ 110.425.950	$ 0	-$ 161.415
SUBSIDIOS							
CORFO			-$ 37.097				

PRESTAMOS	Tasa anual	Financiamiento						
Fase pre comercial II semestre 2015	15%	si	-$ 500.000			$ 874.503		
Comercial proyectos actuales	15%	si		-$ 1.037.818		$ 1.815.150		
Planta 2 MW, Centinela, AMSA	10%	si			-$ 4.500.000			$ 6.588.450
Sistemas aislados	10%	no			$ -		$ -	
Construcción Planta RT	8%	si		$ -			-$ 20.245.950	
Construcción Planta B MW	8%	no						-$ 6.749.865
Construcción Planta C MW	8%	no						

INVERSIÓN	TIR	% recuperación[2]						
Construcción Planta PPA	10,5%	90%					-$ 45.090.000	
Financiamiento Planta Mercado spot	13,9%	65%					-$ 45.090.000	

Saldo caja operativo	$ 226.643	$ 939.359	$ 3.597.737	$ 2.292.359	$ 58.337.675	-$ 8.869.045	-$ 9.506.802
Flujo de caja financiero	$ 226.643	$ 1.166.003	$ 4.763.740	$ 7.056.099	$ 65.393.775	$ 56.524.730	$ 47.017.928

Inversión; plan de expansión próximos 5 años $ 123.213.633

(Fig. 10, Cash flow extract)

2.1. Levelized Costs of Energy (LCOE)

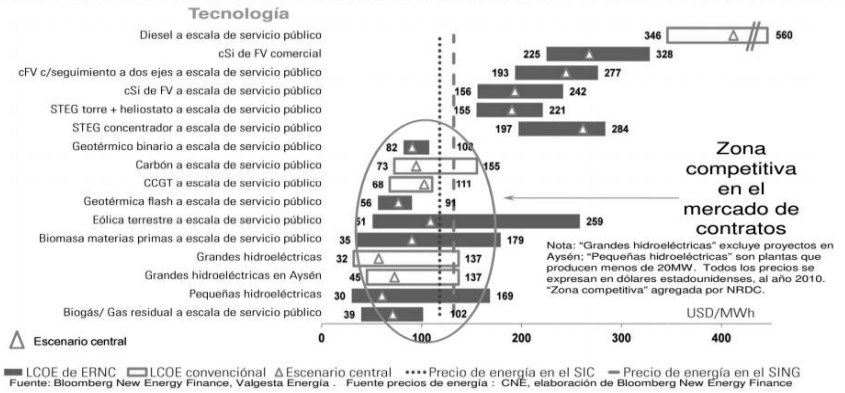
The Levelized Cost of Energy (LCOE) is defined as the theoretical cost of generating electricity, used to compare unit costs over the economic life of different technologies, ie, they correspond to the costs that an investor has to face in terms of stability of electricity prices and assuming a certainty given production costs. In other words, define costs in the absence of market risks or technology. According to the International Energy Agency (IEA), they approximate quite well the actual costs in a regulated monopoly market but suffer distortions in liberalized electricity markets.

Client	Scenario I
Discount rate	15%
Useful life (year)	15
Investment (US$)	**$ 6.000.000**
installed power KW	2000
Built cost KW, US$	$ 3.000
LCOE US$	**$ 0,0980**
Annual Energy KWh	10.687.200
Annual maintenance cost	$ 960.000
Carbon bond US$	$ 3,0

(Fig. 11, Investment analysis for 2 MW Wilefko plant)

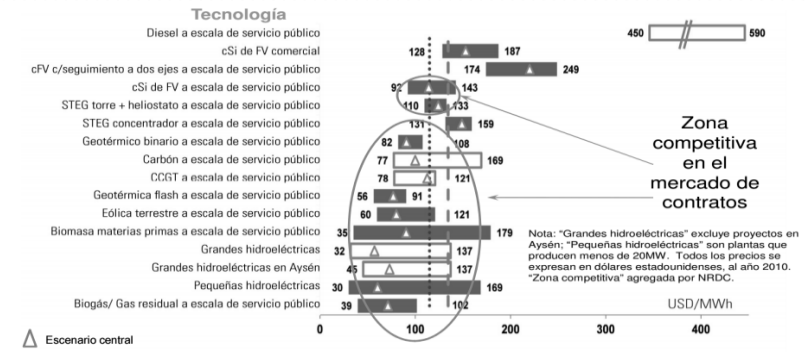
Comparing ESWL with different technologies and temporal scenarios, Valgesta energy source.

FIGURA 1.1: COSTO NIVELADO DE ENERGÍA EN CHILE, LCOE 2011



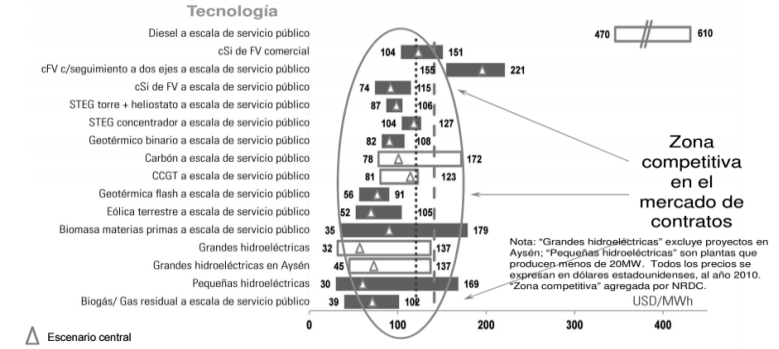
Fuente: Bloomberg New Energy Finance, Valgesta Energía . Fuente precios de energía : CNE, elaboración de Bloomberg New Energy Finance

FIGURA 1.2: COSTO NIVELADO DE ENERGÍA EN CHILE, LCOE 2020



Fuente: Bloomberg New Energy Finance, Valgesta Energía Fuente precios de energía : Programa de Estudios e Investigaciones en Energía del Instituto de Asuntos Públicos, Universidad de Chile ,elaboración de Bloomberg New Energy Finance

FIGURA 1.3: COSTO NIVELADO DE ENERGÍA EN CHILE, LCOE 2030



Fuente: Bloomberg New Energy Finance, Valgesta Energía . Fuente precios de energía : Programa de Estudios e Investigaciones en Energía del Instituto de Asuntos Públicos, Universidad de Chile ,elaboración de Bloomberg New Energy Finance

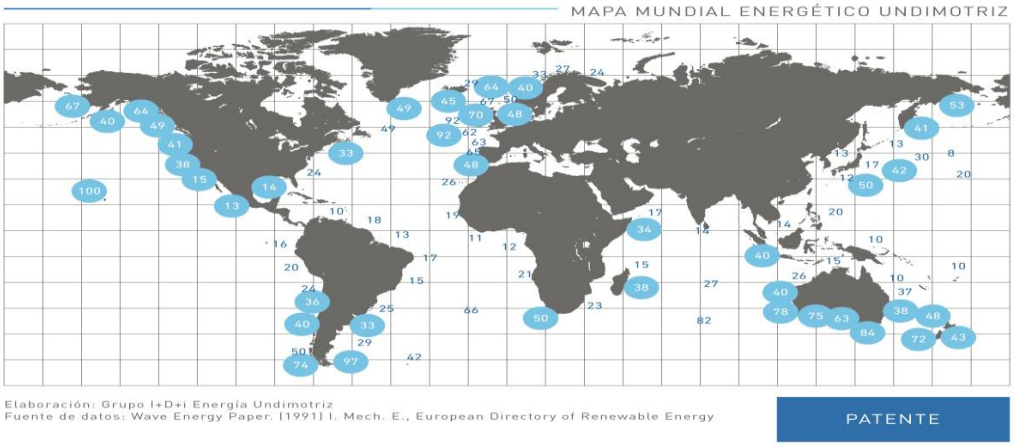
III. INTERNACIONALIZATION

1. General Considerations

By 2010 in the world, there are 1.5 billion people without electricity, 800 million people without access to water, 2500 without access health services, killing 800 children per day. Global organizations and States has a problem that urgently need a solution, therefore, Wilefko can be an opportunity to mitigate the lack of energy to the inhabitants living close to the coastlines worldwide.

2. Potential Market

The availability of global ocean energy is estimated in 28,000 TWh / year, the celestial circles (see Fig. 12) indicate the profitable points for installation that meet the minimum return required for the project.



(Fig. 12, Wilefko Commercial Exploitation Point Identifier, worldwide)

We have selected a group of countries with high economic interest in market size, commitments on renewable energy and industrial patent protection. Applying the 32% efficiency of Wilefko technology, and if occupies 1% of the cost edge of each of the countries, 8,200 MW installed capacity would be obtained, which would mean 56 fewer tons of CO2 into the atmosphere less.

	Population total Millones (1)	Electric power consumption per capital KWh (1)	people without electricity MM 2013 (1)	Consumption GWh/yr anuales 2012 (1)	Generaction electric NO fósil % (1)	Average price US$ cent/KWh anual (2)	Electricity for industry MWh US$ (3)	Electricity for households MWh US$ (3)
Target Market Electric								
Chile	17	3.568	0,10	62.316	5,47%	16	126,70	185,38
India	1.237	684	309	846.024	2,98%	19		
Canadá (6)	35	16.406	s/d	572.239	22,87%	8		
Australia (7)	8	10.720	s/d	90.717	1,85%	21		
United Kingdom (8)	63	5.516	s/d	348.783	10,60%	20	134,17	220,74
New Zelandia	4	9.399	s/d	41.665	33,75%	22	94,34	231,76
USA	314	13.246	s/d	4.158.119	11,99%	12	66,98	118,83
West Coast (5)								
Alaska (5)								
Hawaii (5)								
TOTAL Market				**6.119.863**				

	Electricity demand 2025 anuales MWh/yr (11)	Electricity demand 2040 anuales MWh/yr (11)	longitud de costa Km(4)	Potencial Total annual wave energy TW/yr (12)
Target Market Electric				
Chile	130.235	288.060	4.200	1.049
India	2.009.533	5.101.624	6.000	263
Canadá (6)	757.534	1.024.702	11.000	183
Australia (7)	134.925	338.686	25.760	1.300
United Kingdom (8)	439.847	564.676	12.429	230
New Zelandia	56.035	77.098	15.134	1.657
USA	5.258.468	6.771.187	19.924	950
West Coast (5)				250
Alaska (5)				620
Hawaii (5)				80
TOTAL Market	**8.786.578**	**14.166.033**	**94.447**	**5.632**

(Fig. 13, Comparative table of countries with potential wave energy)

1) The World Bank http://www.worldbank.org/
(2) IEA International Energy Agency 2011 http://www.iea.org/
(3) Key World Energy STATISTICS 2013, International Energy Agency
(4) http://es.wikipedia.org/wiki/Anexo:Pa%C3%ADses_por_longitud_de_costa
(5) Mapping and Assessment of the USA Ocean Wave Energy Resource, EPRI, Electric power research institute, 2011// Bureau of Ocean Energy Management (BOEM)
(6) BEDFORD INSTITUTE of OCEANOGRAPHY, Her Majesty the Queen in Right of Canada, 2009,pag 7
(7)Copyright Carnegie Wave Energy Limited © 2013// The potential of wave energy, Jenny Hayward and Peter Osman, CSIRO Energy Transformed Flagship,© 2011 CSIRO
(8) Carbon Trust Foreword to UK Wave Resource Study. Carbon Trust and AMEC Environment & Infrastructure UK Limited October 2012 "
(9) Nine month average value of the incident wave power is 10 kW/m and peak monsoon average is 20 kW/m, Center for the Research and Environment agreement, Cochin 17, India
(10) 32% efficiency applied to Wilefko device, 50% availability of the resource
(11) Projection based on PIB mean growing rate of last 10 years, The World Bank
(12) Recommendations for Chile´s Marine Energy Strategy – a Roadmap for Development, Aquaterra Ltd, United Kingdom

3. Wave Market Trend, year 2050.

After the earthquake in Japan imposed a new global trend for the use of clean energy. Furthermore, in the marine energy market, there is still no dominant product by 2014. It is estimated that marine energy will reach 5% of the world energy matrix, providing 800 TWh/year by 2050.[4]

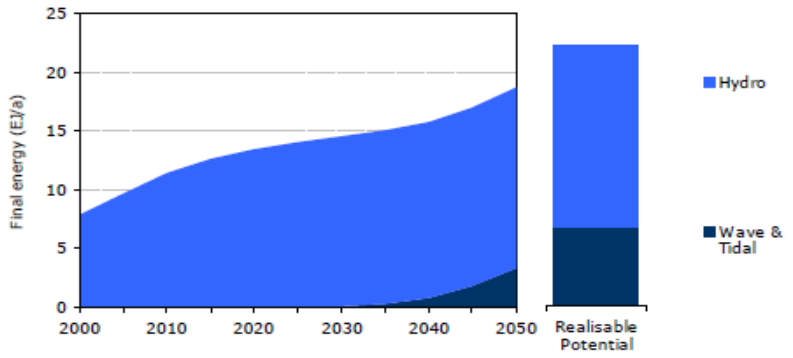


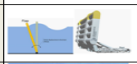
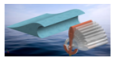
Figure 4 - 4 Global deployment potential of hydro and ocean power. (Left: Evolution of deployment potential over time, right: Maximum feasible potential)

(Fig. 14, Graphic projection of the Wave Energy)

4. Competition

26 The following table shows the technological expertise in wave energy based on flaps. Different evaluation criteria are identified, the most important is the yield per m2 where Wilefko produces more energy per ton of iron.

COMPARATIVE CHART

Technology Name	Images	Angular Variation	Flap Design	Surface of Impact	Deep of Operation	Declared Efficiency
Wave Roller Devices		 40°	Medium	26 m Wide, 12m high --> **1,6 KW m2** **Total unit 500 Kw**	10 to 15 m	The efficiency of the hydraulic system is about 60 % (depends of operating point), so 500 kW per unit absorbs about 830 kW from the waves.
Aquamarine Oyster		 35°	Medium	26ms 12m --> **1,5 KW m2, Total unit 800Kw**	12 to 20m	Oyster 800 represents a step change in design, size and power output. The oscillator is about 50% wider (26m) in comparison to Oyster 1, but produces about 50% more energy because of the hydrodynamic design optimization (a)
Bio Power Systems		 35°	Medium	Type–B: 3mx2.5mx2.5m, 4kW --> **Total unit 1,5 KW m2**	12 to 300m	50%
WILEFKO		 135°	High	1mx1m --> **5,9 KW m2**	5 to 10m	57% according to computer aid modeling with CFD Star-CCM+ software
Comments		The type of Wilefko wave palette allows greater rotation	Our concave parabolic shape design of our flaps facing the waves allows Wilefko to concentrate energy from energies becoming a better capture method, see Fig 1.	Capture performance for 1m² flap facing 2 m waves, is calculated. 2m wave was chosen, due to the fact that is the most common high found in Chilean coastline, see Fig. 2e, Fig. 1	Depth of the location of generating devices is a key parameter, because in deeper waters maintenance costs are higher	This values are only referential. Capture method of these technologies is unknown.

(Fig. 14, Competitive analysis table, by technology)

[4] Source :the energy report - 100% renewable energy by 2050
WWF, this report has been produced in collaboration, with: ECOFYS, OMA ,published in January 2011 by WWF
http://awsassets.panda.org/downloads/the_energy_report_lowres_111110.pdf

II. TECHNOLOGY

1. Summary

Studies commissioned by the UN (United Nations) estimates that wave power, reach a global market share of 5% for 2050, contributing 800 TWh of energy annually. Currently, worldwide, there are approximately 1,500 types of such technologies in different stages of maturity, from conceptual design to stage pre-commercial phase, but in 2015 there is still no dominant product on the market of wave energy.

To date, Wilefko has developed a motor capable of turning waves thousands of wave impacts in one continuous motion. It consists of a metal structure anchored to the seabed with a series of concave blades that are impacted by the waves, besides having an intermediate phase energy storage using compressed air for power generation. This multipurpose wave engine use it to:

- Generation of electricity.
- Pumping seawater.
- Supplying compressed air to industrial or mining sites.

In Chile, wave technology has superior to the other NCRE potential is estimated in the order of 160GW to 240GW in our 4200 km of coastline. Sea waves are available, abundant and distributed throughout the country without economic alternative use, and most important energy resource, are not exclusive copyrights on portions of sea and freshwater rights continental.

2. Opportunity Technologic

Wilefko is a pioneering initiative with global impact, with Chilean and scalable technology from facilities 100KW to 20 MW or higher plants. Its implementation allows organizations to have the attributes of clean, following the global trend of CDM (Clean Development Mechanism), along with contributing to the reduction of greenhouse gases.

WILEFKO on three years of research with real sea trials, it has been estimated that the average annual energy available in the Chilean coast is **175,000 MWh / year per 1 km of coastline**, equivalent to an installed capacity of 20 MW for 1 Km[5].

[5] Based on studies of wave condition of NOAA (National Oceanic and Atmospheric Administration (2009-2014) nine Chilean coastal towns together with the results of wave conditions Wilefko obtained from field tests with a scale prototype estimate

3. Competitive Advantages

• The energy storage using compressed air would deliver electricity at peak demand, for example, night power, this being our greatest competitive advantage over the other URE.

• The availability of wave energy resource is 30% higher than the Wind and 50% higher than the sun, because the latter does not produce energy at night, however the sea is in constant movement 24 hours seven days per week.

• High scalability facilities from individual devices 100 KW to 20 MW or more farms.

• The technology does not pollute or generate toxic waste.

• The design includes multi-flaps that are able to extract from 2-3 times more energy from the same wave.

• Catch the wave of surf, which is the most concentrated wave energy because the particles rise back column concentrating energy in a shorter wave.

• More competitive installation costs, because it is done from shore, do not need ships for transport and installation, as other wave energy technologies.

4. Value Proposition

Our value proposition for companies considered:

• Incorporate new production processes of renewable energy sources, promoting the diversification of the energy matrix.

• Incorporate production processes CDM (Clean Development Mechanism) with renewable energy and thus contribute to the reduction of greenhouse gases.

• In the context of corporate social responsibility, 100K Wilefko teams are a tool for mitigation plans, repair and socio-environmental compensation; enabling improved access to water and electricity in villages at risk.

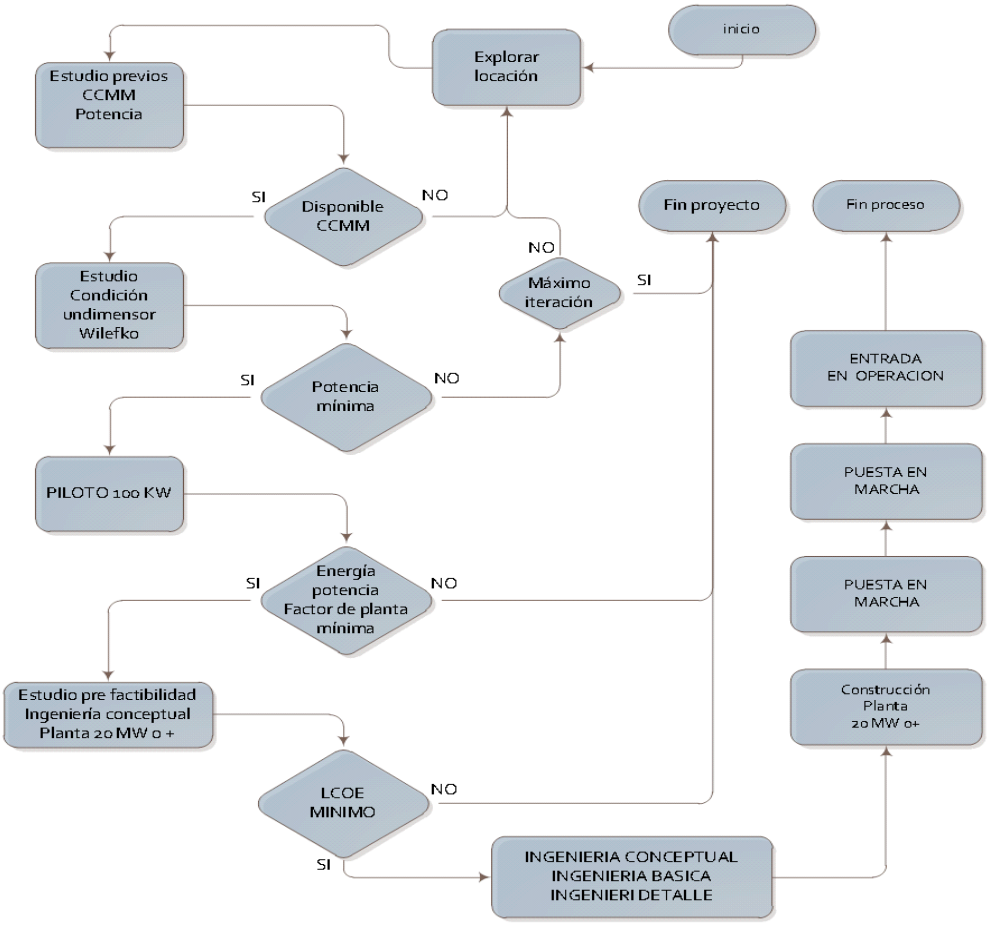
• Creating value of corporate image for the use of renewable energies associated with promoting the development of new Chilean technology.

• Transform active carbon bonds.

5. Decision Tree for projects

The Wilefko technology, feature modularity, scalability and control of early release, allowing lower investment risks, characteristic of a new technology. Therefore, it is recommended for all future installations that must start with the previous study of wave power and status.

The decision tree (Figure 15) shows the processes and sequences of decisions possible outcomes. It allows to lower investment risks with an early exit from the project by the failure of marine resources. In addition, gird processes to reach in stages establish a project for a plant of 2 to 20 MW or higher.



(Figure 15. Homemade Decision Tree[6])

[6]. Glossary; CCMM: Maritime concession; LOCE: theoretical cost of generating electrical power

6. WILEFKO TECHNOLOGY

Our invention was developed from observing the behavior of sea waves breaking. Wilefko developed a system engine driven by the kinetic energy of ocean waves, comprising trains of oscillating flaps with an intermediate stage of accumulation of compressed air, with three purposes:

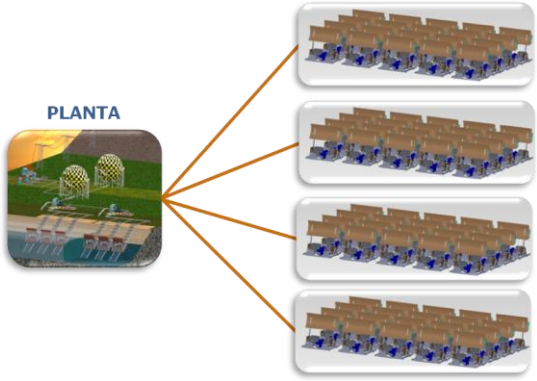
1) To generate electricity
2) Provide compressed air
3) Pumping water for production processes.

The main competitive advantage is the accumulation of energy, can deliver electricity at peak hours and becoming independent of the available resource. For example, delivering power night where solar energy has no possibility for obvious reasons, no sun.

(Fig. 16, Field test photo)

7. Scaling

One of the properties of Wilefko technology is its high scalability facilities from individual devices 100KW to 186 farms or arrays of wave trains per kilometer to reach installed capacity of 20 MW per kilometer.

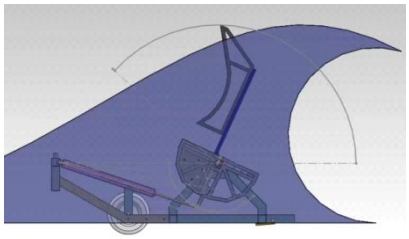


(Fig. 17, Schematic matrix of wave trains)

8. Transformation Stages

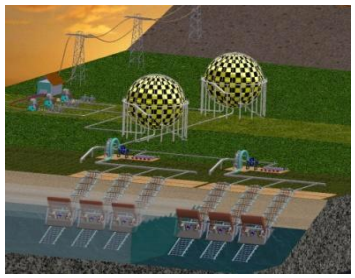
Capture → Transformation → Accumulation → Generation

Harvesting and processing stage; the palette is hit by the wave causing a movement or acceleration pulse, the mechanical energy is stored in a flywheel start, allowing conserve energy and reduce dispersion cave produced by the series of explosions wave energy. The design includes a wave train of several palette so increase efficiency in capturing energy from waves, reaching 2 to 3 times the nominal power of the wave front.



(Fig. 18, capture method)

Storing stage; compressed air is stored in a large reservoir of air, it can operate with a similar approach hydroelectric dams, which aims to deliver energy in a controlled manner. To reduce energy losses by changes in ambient temperature, the deposits will be in the sub soil,



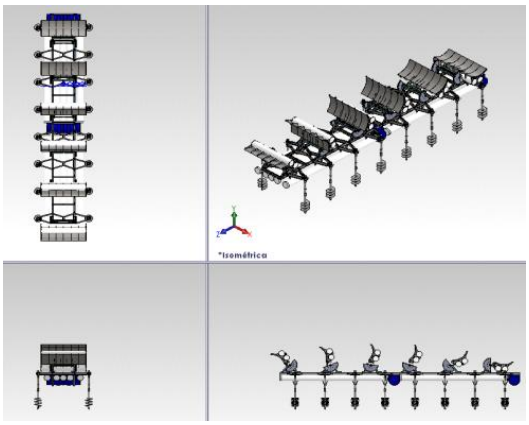
(Fig. 19, serial sight of a plant with compressed air tanks)

Generation / Distribution Stage

Compressed air can be delivered according to the trade agreements, the use of an air motor and a generator.

9. Wave Train

The wave train consists of two separate structures. The first call bed rail is a metal structure coated in HDPE, anchored to the seabed by means of screws 8-10 fiberglass. The second structure, called train vane comprises a metallic structure coated HDPE, having from 6 to 8 pallets concave receiving wave impact fiberglass. The assembled device has the following dimensions: length 20m, width 3m, height 2m palette at rest. Approximate Weight 8 Ton.



(Fig. 20, conceptual design, wave train 6 flap)

The concave design of the pallet and 135 ° rotation provides increased energy capture by wave period. Estimated 57% efficiency in capturing energy. For more detail of the process, see Annex 5.

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