

## Final Report: Minergie Chile 2019 - 2022

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# Minergie Chile

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### Author(s):

Andreas Meyer, Minergie Schweiz  
Stefanie Steiner, Minergie Schweiz  
Nicola Borregaard, EBP Chile  
Montserrat Bobadilla, EBP Chile

<b>Date of the Report: 03.05.2022</b>	<b>Contract Number: 2020.03</b>
<b>Institution: Minergie Schweiz</b>	<b>Country: Chile</b>

Prepared by:

**Minergie Schweiz**

Bäumleingasse 22, 4051 Basel, Switzerland

+41 61 205 25 46, [info@minergie.ch](mailto:info@minergie.ch), [www.minergie.ch](http://www.minergie.ch)

**EBP Chile**

La Concepción 191, Piso 12, Of. 1201, Providencia - Santiago, Chile

+56 2 2573 8505, [info@ebpchile.cl](mailto:info@ebpchile.cl), [www.ebpchile.cl](http://www.ebpchile.cl)

**MINERGIE®**

With the Support of:

**REPIC Platform**

c/o NET Nowak Energy & Technology Ltd.

Waldweg 8, CH-1717 St. Ursen

Tel: +41(0)26 494 00 30, Fax: +41(0)26 494 00 34, [info@repic.ch](mailto:info@repic.ch) / [www.repic.ch](http://www.repic.ch)

The REPIC Platform is a mandate issued by the:

**Swiss State Secretariat for Economic Affairs SECO**

**Swiss Agency for Development and Cooperation SDC**

**Federal Office for the Environment FOEN**

**Swiss Federal Office of Energy SFOE**

The author(s) are solely responsible for the content and conclusions of this report.



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# 1. Summary

**Why?** Chile imports large quantities of fossil fuels and is therefore a large emitter of CO<sub>2</sub>. The building sector is growing rapidly due to the increase in population and wealth. This is problematic because Chilean buildings usually have low energy efficiency and at the same time high CO<sub>2</sub> emissions. New technologies (heat pump technology, external insulation of facades, building-integrated photovoltaics, windows with heat-insulating glazing, heat recovery from exhaust air, etc.) are still less widespread than in Switzerland, but are on the rise. The Ministry of Energy in Chile has therefore set the goal of saving 20% of energy by 2025<sup>1</sup>; in addition, an energy certificate is to be introduced for new buildings<sup>2</sup>.

With the Minergie Certification, Switzerland has a construction method that fits almost perfectly to promote an accelerated development towards a better building standard in Chile. The standard combines energy efficiency and the reduction of fossil fuels with increased value retention and comfort. In addition, it allows all technologies (except purely fossil heating systems), has been tested almost 50'000 times in Switzerland and has been applied in around 12 countries. The Minergie Board has decided to push ahead with internationalisation. The positioning as a Swiss quality and comfort label seems all the more important in Chile, as Minergie will certainly not be part of Chilean energy policy to the same extent as in Switzerland.

**What?** The Minergie Certification was simplified, adapted to local conditions, and thus introduced in Chile. Its advantages - simplicity, communicability and the link to comfort - are also promising in Chile. As a local player, EBP Chile represents the certification of Minergie Switzerland in Chile, is responsible for training and further education and is the main contact for Minergie in Chile.

**How?** The project was realised in three phases:

1. **Adaptation of the Minergie standard to Chile:** the standard was simplified in such a way that it is achievable and affordable - and still has clear advantages in terms of energy and comfort compared to conventional construction and other labels. A test application in 2 pilot projects (new residential buildings) has served to definitively define the standard for Chile based on the experience gained.
2. **Development of a self-supporting, non-profit business model for "Minergie Chile":** EBP Chile is the local actor for Minergie certification in Chile. Minimal basic principles have been developed for market entry (regulations, means of communication and simple verification and certification procedures). EBP Chile is responsible for the organisation, training, and further education as well as for the marketing of the Minergie brand in Chile.
3. **Establishing Network:** Building up a Chilean network of Minergie experts through education and training, so that the replication of the pilot projects can be guaranteed.

**Where to?** Based on the experience in Chile so far, the first Minergie projects were implemented in Mexico. There are also plans to offer Minergie certification in other countries in South America, such as Colombia. Initial talks for replication are already underway in Colombia.

## 2. Optional: Abstract in local language

Not required for this project.

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<sup>1</sup> <http://energia.gob.cl/eficiencia-energetica>

<sup>2</sup> <http://www.energia.gob.cl/tema-de-interes/proyecto-de-ley-de-eficiencia>

### 3. Starting Point

The building sector is the main energy consumer in Chile, along with transport and industry (especially in the mining sector). The following factors shape the construction of homes and buildings in Chile: There is usually a cool to very cold winter climate in the southern half of the 4,300 km long country. The heating periods last between 7 and 11 months. About the economic aspects, a growing middle class with considerable purchasing power and the explicit desire for more living comfort is contributing to an increasing demand. As a result of today's high consumption of firewood and poor energy wood quality, air pollution is very high. Environmental awareness, however, is fundamentally well anchored in government circles as well as in the population.

Energy standards in construction have not yet penetrated the market in Chile. The international labels LEED (large buildings) and Passive House (similar to Minergie-P) are well known and used to a lesser extent; in addition, there is a state energy label similar to the Swiss GEAK (<http://csustentable.minvu.gob.cl/item/sello-de-construccion-sustentable-de-viviendas-en-chile/>). The regulatory requirements today are comparable to the status of Swiss legislation in the 1990s - i.e. around the time the Minergie standards were first developed.

As the economy continues to grow, a broad section of the population increasingly wants improved living comfort. In urban development, buildings with more than 1,000 single-family homes are the order of the day. The current building standards in such developments are usually extremely poor. For example, the indoor air temperatures in the buildings are often very low during the winter. This is no longer accepted by the population. With the construction and building technologies used today, the demand for heat and thus the consumption of fossil fuels will continue to rise. There is still no trend to improve buildings in terms of thermal insulation and building envelope airtightness. But only an improved construction method offers the chance to substantially cover the increasing energy demand in the future with locally available renewable energies.

In Switzerland, the Minergie standard is writing a success story: since 1998, Minergie has been the Swiss label for comfort, efficiency and value retention for buildings and flats. To date, a total of around 50,000 buildings have been certified to the Minergie standard in Switzerland and neighbouring countries. But Minergie is much more than just a standard: Minergie is a quality label, protected by a trademark. It is based on a certification system that has been tried and tested over many years.

The overall goal was to show how buildings in Chile can be planned and constructed or renovated according to Minergie standards so that they meet the criteria of energy efficiency, climate and comfort to a high degree on the one hand and take local conditions into account on the other.

## 4. Objectives

The project had the following 3 objectives:

- **Objective 1 Adaptation of the Swiss Minergie standard to Chile:** Practical experience has been gathered on whether and how new residential buildings can be planned and built in Chile according to the principles of Minergie. In Chile, a construction method that combines comfort, energy efficiency, renewable energies and value preservation as common objectives is almost unknown. The purpose of the transferability of the Minergie standards, including certification, has been investigated on the basis of residential building projects.
- **Objective 2 Introduce Minergie as an independent system in Chile:** The Minergie model is to function as an independent system in Chile. Minergie residential buildings should become known and in demand in Chile as new residential buildings with high comfort, above-average value and very low energy consumption, with the associated quality assurance through a simple, affordable certification system. The organisational model, financing and marketing model are defined and introduced. As awareness increases, the use of the Minergie brand becomes more attractive, which in turn has a positive effect on awareness.
- **Objective 3 Guarantee replication of the model:** The Minergie pilot projects are used as demonstration projects and for further training to motivate other site developers for Minergie residential buildings, also in other Latin American countries, for example in Mexico and Colombia.

## 5. Project Review

### 5.1 Project Implementation

Three Swiss companies were involved in the consortium responsible for the project Minergie Chile. As the applicant, the Swiss Minergie association was entrusted with the lead management and project management. Binz Energie am Bau GmbH and EBP were involved in the technical processing of all work packages and contributed Swiss expertise in sustainable construction. As a local partner, EBP Chile played a significant role in the success of the project implementation. Swiss experts from the Minergie and EBP network were specifically brought in for training and further education.

1. **Association Minergie** ([www.minergie.ch](http://www.minergie.ch)): A great deal of specific knowledge and experience has resulted from the successful Minergie certifications over the last 20 years. This knowledge was used to set up Minergie Chile and passed on to our local partner EBP Chile. The Minergie Chile organisation was set up in cooperation with the Minergie Association. It was possible to draw on the experience of Minergie in Switzerland (reorganisation 2016ff), other countries (France, Germany) and the findings of the "Business Plan Minergie International" from 2014. The REPIC project is also well embedded in the current planning of the Minergie Association, which is evaluating market entry in Latin America (focus on Chile, Colombia, and Mexico) to apply Swiss know-how in sustainable building in other countries as well.
2. **EBP** ([www.ebpchile.cl](http://www.ebpchile.cl)) has been active locally in the fields of energy, climate, and resources for more than ten years and is excellently networked in the Chilean energy and building sector. EBP Chile has a team of 10 employees who focus on sustainable construction. EBP ([www.ebp.ch](http://www.ebp.ch)) also has access to Swiss experts in the field of sustainable construction. EBP was responsible for planning the test objects for the Minergie-relevant parts of the buildings (building envelope and building services). This also applied to the preparation and submission of the Minergie certificate to the Minergie Association, including all necessary information on the certification steps. The certification of the pilot projects was carried out through the regular channels of Minergie Switzerland. The training and further education were carried out jointly by Minergie Switzerland and EBP.
3. **Binz Energie am Bau GmbH** ([www.arminbinz.ch](http://www.arminbinz.ch)) was founded in 2013 and has been active in the publication of technical literature, consulting mandates for the SIA and the Minergie association. Certification incl. support for applicants of the first pilot projects within this REPIC-Project was carried out under close supervision of Armin Binz. This process was also of great importance for the development of appropriate certification procedures in Chile and appropriate certification tools, such as an application guide. A provisional certificate will be issued based on this pilot project certification (formality pending).

All three companies have worked very closely together over the past 3 years to successfully establish Minergie Chile.

## 5.2 Achievements of Objectives and Results

All objectives set in the project, except for 3a (30 specialist partners), were fully achieved. Goal 3a was achieved by about 50%. The table below shows the target achievement for each objective. The products of each activity are in the annex (see link in the column "Products").

### Phase 1: Adaptation of the Minergie standard to Chile

#	Description	Activities / Milestones	Products	Achievement of Objectives
1a	<p><b>Chilean standards and parameters, lighthouse projects</b></p> <p>Description of the key Chilean standards as well as energy parameters for energy-efficient construction</p>	<p>Conduct interviews and describe key standards and energy parameters</p> <p>Select and describe lighthouse projects for energy-efficient construction in Chile, collect findings for the adaptation of the Minergie - Chile label</p>		Reached
1b	<p><b>Standard Minergie Chile</b></p> <p>Elaboration of a first version of the Minergie standard for Chile based on the Chilean interests of the building industry and the Chilean building culture and standards</p>	<p>Draft Minergie standard according to adaptation to climatic types, building culture and industry, as well as Chilean norms</p> <p>Discuss and adapt design with recognized professionals of the building industry</p>	Standard Minergie Chile: annex 9.1	Reached
1c	<p><b>Identification of 2 new building projects, test application</b></p> <p>Contacting site developers to identify 2 new building projects that want to apply the Minergie standard, test application in planning and implementation</p>	<p>Identify 2 new building projects, analyse the planning documents of the building project according to the Minergie criteria</p> <p>Apply and test the Minergie standard based on the 2 new building projects</p> <p>Draw up regulations for Minergie Chile based on the findings of the test certifications</p>	Pilot projects: annex 9.2 and 9.3	Reached
1d	<p><b>Adaptation Minergie – Standard</b></p> <p>Based on the experience gained, the Minergie Chile standard will be adapted</p>	Develop lessons learned and recommendations, adapt the Minergie standard to Chilean conditions	Standard Minergie Chile: annex 9.1	Reached

## Phase 2: Development of business model and fundamentals

#	Description	Activities / Milestones	Products	Achievement of Objectives
2a	<p><b>Define organization of Minergie – Chile</b></p> <p>Elaboration of the organization of Minergie Chile (incl. license agreements and patent rights)</p>	<p>Elaborate the structure and organization of Minergie Chile</p> <p>Clarify and describe roles and tasks of the involved stakeholders</p> <p>Develop a license agreement for a Chilean agency</p>	Licence agreement: annex 9.4	Reached
2b	<p><b>Elaborate Business Plan Minergie Chile</b></p>	Develop business plan, including financing and sales model	Business plan: annex 0	Reached
2c	<p><b>Create basis documents</b></p> <p>Basic documentation for certification and application are in place</p>	Elaborate the most important documents and tools, especially website, verification form, regulations and flyers / videos (all in Spanish)	Basis documents: annex 9.6	Reached

## Phase 3: Network development and replication

#	Description	Activities / Milestones	Products	Achievement of Objectives
3a	<p><b>Minergie - specialist partner model with training</b></p> <p>The introduction of a specialist partner model (B2B approach) helps to spread Minergie quickly in Chile</p>	<p>Minergie - Develop specialist partner model, develop training offer, implementation, if possible, in the pilot projects</p> <p>30 persons are familiar with the Minergie standard and are allowed to call themselves specialist partners</p>	Trainings: annex 9.7	<p><b>Partially achieved</b></p> <p>So far, 16 persons have been trained as Minergie experts. It is planned to hold one more basic course in 2022 to achieve the target.</p>
3b	<p><b>Public authorities</b></p> <p>The authorities are involved within the framework of meetings and workshops</p>	Organization of three workshops and meetings with five authorities	Meetings with authorities were held	Reached
3c	<p><b>Marketing and publicity</b></p> <p>The application and inspection of the reference objects creates publicity</p>	Use lighthouse projects as a marketing platform, visit lighthouse projects with professionals and potential customers in Chile, incl. trade and public media	Marketing products: annex 9.8	Reached

The set milestones were more than achieved for the most part. M2.1 (2 provisional certifications) and M3.2 (30 specialist partners) were not fully achieved. In the case of M2.1, it is a formality, and in the case of M3.2, the aim is to reach the milestone in 2022.

Milestones	Products	Achievement of Milestones
<b>M1:</b> The draft Minergie Standard Chile is elaborated and adapted after evaluation by recognized Chilean experts.	Standard Minergie Chile: annex 9.1	<b>Reached</b>
<b>M2.1:</b> At least 2 new buildings are provisionally certified with the Minergie standard and the Minergie standard is adapted based on lessons learned.	Pilot projects: annex 9.2 and 9.3	<b>Partially achieved</b> The pilot projects were planned according to the Minergie-Chile standard. The provisional certification (incl. certificate) is a formality that is still pending.
<b>M2.2:</b> The organization is elaborated, the license agreement is in place, the business plan is elaborated and ready for the official launch of Minergie Chile.	Business plan: annex 0 Licence agreement: annex 9.4	<b>Reached</b>
<b>M3.1:</b> The website of Minergie Chile is launched and all-important documents are available in Spanish.	Basis documents: annex 9.6 Marketing products: annex 9.8	<b>Reached</b>
<b>M3.2:</b> The specialist partner model is developed and the Minergie lighthouse projects are known to a wider audience. 30 people are allowed to call themselves specialist partners. 3 workshops and meetings with 5 authorities have been held.	Trainings: annex 9.7 Meetings were held	<b>Partially achieved</b> So far, only 16 persons have been trained as Minergie experts. It is planned to hold one more basic course in 2022 to achieve the target.

Table 1: Milestones and project status to date

### **5.3 Multiplication / Replication Preparation**

#### **Standard, documents and tools** ([https://www.minergie.cl/media/reglamentominergie\\_v1\\_2022.pdf](https://www.minergie.cl/media/reglamentominergie_v1_2022.pdf))

Originally, the standard was developed only for climate zones D to I. I.e., from the metropolitan district (Santiago) down to the southernmost district of Patagonia. During the project development, it became obvious that the extension to the hotter climate zones in the north would be a good starting point for the application of Minergie in other emerging countries. Thus, the standard Chile was extended to all Chilean climate zones and a draft for Mexico was developed and tested in two pilot projects. With the current structure, the regulations can be transferred relatively easily to other emerging countries. All further documents and tools can be adapted to other countries.

#### **Online platform** (<https://international.minergie.ch>)

The online platform for the project certification was programmed in such a way that additional countries can be added with little effort. The platform provides the basic structure and allows individual adjustments for each country.

#### **Website** ([www.minergie.cl](http://www.minergie.cl))

The Minergie Chile website can easily be copied for other countries. A parent website has been set up ([www.minergie.com](http://www.minergie.com)) from which links are provided to the various countries.

#### **Organisational structure**

The organisational structure must be set up individually for each country. The experience in Chile has shown that a strong local partner as a licensee is very important. But other structures are also possible and it depends on the country which cooperation is most suitable. For example, a model can be considered in which local specialist partners develop Minergie projects and certification is carried out in Switzerland.

#### **Cooperation with other Swiss projects in Latin America**

Minergie also communicates the experiences of Minergie Chile at public seminars and events, such as the training courses and conferences organised as part of the CEELA project (see [Proyecto CEELA](#)).

## 5.4 Impact / Sustainability

The building sector causes around 40% of total greenhouse gas emissions in the world. The Minergie standard prohibits the use of fossil fuels and will thus make a significant contribution to reducing greenhouse gas emissions in the future.

In this project, mainly basic work was done, which cannot be quantified. The savings will result from the application of the developed Minergie standard in the implementation phase. The implementation phase started with the completion of the REPIC project and will lead to massive savings in energy consumption and greenhouse gas emissions.

The table below shows the reduction in energy consumption and greenhouse gas emissions based on the example of the pilot project "Casa Las Pataguas". With each additional Minergie building, these savings are multiplied.

<b>Ecological</b>	<b>Unit</b>	<b>At the REPIC Project's Completion</b>
Installed renewable energy capacity	[kW]	Photovoltaic system: 2.89 Heat pump: 17.3 (thermal output) Total: 20.19
Renewable energy produced	[kWh]/year	13'066 (Calculated by <a href="#">CEV - Calificación Energética de Vivienda</a> )
Amount of fossil fuel energy saved	[kWh]/year	29'104 (CEV – Calculation)
Greenhouse gas reduction	[t CO <sub>2</sub> -eq]/year	11.93 (CEV – Calculation)
Newly collected and separated waste	[t]	None
Newly recycled waste	[t]	None
<b>Economic</b>		
Energy costs (LCOE)	[CHF/kWh]	Data not available
Triggered third-party funding/investments	[CHF]	Data not available
Local private income generated	[CHF]	Data not available
<b>Social</b>		
Number of beneficiaries	[Number]	Data not available
Number of new jobs	[Number]	Data not available
Number of trained personnel	[Number]	16 (Basic Course)

## **6. Outlook / Further Actions**

### **6.1 Multiplication / Replication**

#### **Next steps**

The most important step in the following months is to look for further projects for certification in Chile. This will generate income and the certification body can gain experience in processing. Therefore, we will focus on different marketing measures in the next months. As a first measure, a video with industry partners is planned (see annex 9.8). Further marketing measures will be planned in May 2022.

#### **Multiplication / replication**

For the multiplication and further dissemination in other markets, it is planned to focus on Mexico and Colombia next. There is already a draft for the Minergie Mexico standard (developed based on the Minergie Chile standard). The next steps are the revision of the standard, the launch of a website "Minergie Mexico" and the setup of the organisational structures in Mexico.

#### **Hurdles**

In order for Minergie Chile to become financially self-supporting in the long term, it must be possible to process a sufficient number of certifications each year. The biggest hurdle is that Minergie must become sufficiently well known to be charged to certify more building projects.

### **6.2 Impact / Sustainability**

#### **Comfort in buildings is improved**

The comfort in buildings with well insulated and sealed exterior walls, floors and roof surfaces is higher. In winter, the inner surfaces of the building envelope are warmer, there is no cold radiation and there is no draught. During hot summer days, the building is better protected from excess temperatures and increases comfort in the buildings.

#### **Energy costs and CO2 emissions are reduced**

Every kilowatt hour of energy saved is reflected in the bank account. Any additional costs of improved building quality can thus be compensated for. A renewable energy supply for heating/cooling and hot water and the self-production of clean electricity makes the building independent and fit for the future. The Minergie label can make a key contribution to reducing CO2 emissions in buildings in Chile.

#### **Swiss certification increases credibility**

For little money, building owners and planners receive independent quality assurance from Minergie. The Minergie certification bodies pool knowledge and experience from countless Minergie projects. The checks and recommendations for optimising the building envelope and building services are based on our many years of experience and also increases the credibility of the buildings in Chile.

#### **Maintaining value**

The quality of construction has a strong impact on the medium and long-term value of a property. According to investigations in Switzerland the added value of a Minergie single-family house compared to a conventional single-family house is around 7% with otherwise identical house characteristics. For a multi-family house, the added value or the premium achieved on the market is 3.5 %.

## 7. Lessons Learned / Conclusions

### **Demand for a label is existing**

There is a demand for a building label that is comprehensive and easy to use in Chile. This was also shown by the large number of participants at the launch event. There is also a demand for training and further education in the field of energy-efficient construction. This is shown by the fact that 16 people already took part in the first basic course offered.

### **Adapting Swiss Minergie certification to Chilean conditions**

One of the key success factors is the possibility of adapting Minergie Certification to local climate zones, legal frameworks and market conditions. This adaptation process is crucial so that, on the one hand, the requirements of the Minergie Standard are not watered down, and, on the other hand, country-specific characteristics can be integrated into the certificate. This is one of the decisive differentiating features of Minergie compared to other certificates worldwide.

### **Close cooperation with Swiss companies and Chilean and Swiss experts**

An interdisciplinary team of experts from Switzerland and Chile was put together so that the knowledge could be adapted to local conditions. This requires people who not only bring in the specific technical knowledge from the sustainable building, but also the appropriate soft skills such as communication, respect for other culture, and curiosity to find new solutions.

### **Strong local partner**

EBP Chile has a 10-member team that is well positioned in the Chilean market in the field of sustainable building. For the successful development of Minergie Chile, it is crucial to involve a trustworthy company with experts who know the local market well and are open to the transfer of knowledge and experience from Switzerland.

### **Close cooperation with the Swiss Embassy**

In Chile, Swiss Ambassador Arno Wicki has been a strong supporter of the development of Minergie Chile. The Swiss ambassador has provided strategic and political support for the Minergie project and has helped to build up a network of local players in the field of sustainable building.

### **Expenditure**

Setting up the necessary structures for certification on site involves considerable effort for Minergie as well as for the local licensee. The partner must be willing to make a great effort in advance.

### **Benefits for a broad variety of stakeholder**

Minergie's concept of offering a protected trade mark label that provides specific benefits to many stakeholders is attracting interest. Building owners can easily order quality buildings, architects can distinguish themselves with Minergie buildings, professionals can get certified as Minergie experts, etc.

## 8. References

All publications are listed in the annex.

## 9. Annex

### 9.1 *Standard Minergie Chile*

The standard Minergie Chile was developed based on the following principles:

- Minergie uses environmentally conscious and energy efficient construction to create optimal living comfort and increased building value.
- Minergie buildings are fossil-free.
- Minergie buildings combine the essential key technologies of energy efficiency and renewable energy use within the framework of consistent building concepts: good thermal insulation and air-tightness of the building envelope, efficient solar protection of the windows, energy recovery from exhaust air, efficient building technology for all energy.
- Minergie Chile is simple and cost-effective regarding planning / construction costs and certification.
- Minergie Chile fits well into the environment of the official Chilean energy policy. Synergies are created and competition is avoided.
- As many stakeholders as possible find advantages in using Minergie.
- Minergie creates and favours innovations in the building sector that advance environmental compatibility, comfort and value preservation.

The developed standard is divided into 4 areas and thus covers not only energy but also environmental issues as well as operation:

- Architecture
- Ecology and health
- Technology
- Operation

The standard is published on the website ([www.minergie.cl/media/reglamentominergie\\_v1\\_2022.pdf](http://www.minergie.cl/media/reglamentominergie_v1_2022.pdf)). Below, only the overview table with the mandatory and the voluntary requirements is shown.

Categoría	Temática	Requisitos obligatorios (deben cumplirse todos)	Requisitos electivos (por lo menos la mitad de los requisitos deben cumplirse)
ARQUITECTURA (A)	Confort y Eficiencia Energética (sistemas pasivos)	A1. Datos del proyecto y definición de los espacios	CEV ≥ B
		A2. Aislamiento térmico de la envolvente	
		A3. Reducción de puentes térmicos y hermeticidad	
		A4. Aprovechamiento pasivo de la radiación solar	
		A5. Protección solar exterior de las ventanas	
		A6. Ventilación natural	
IMPACTO AMBIENTAL Y SALUD (E)	Impacto ambiental	E1. Materiales sostenibles y reducción de la huella de carbono	E1.a Madera como material estructural principal E1.b Madera como material principal no estructural
		E2. Impacto ambiental de la construcción y del espacio exterior	E2.a Techo verde E2.b Elementos constructivos expuestos a la lluvia sin metales pesados E2.c Sin protección química contra raíces en láminas de estanqueidad
		E3. Uso eficiente de agua	E3.a Recoger y utilizar el agua de lluvia E3.b Uso de aguas grises
	Salud	E4. Espacios interiores más sanos	E4.a Protección contra el ruido E4.b Sin biocidas en espacios interiores
TECNOLOGÍAS (T)	Energías renovables	T1. Producción de energía sin combustibles fósiles y distribución eficiente	T1.a Aislación de las tuberías de distribución
		T2. Autoproducción de energía	T2.a Toda la superficie de cubierta útil con paneles fotovoltaicos
	Confort y Eficiencia Energética (sistemas activos)	T3. Electrodomésticos e iluminación eficientes	T3.a 100% de electrodomésticos eficientes
		T4. Ventilación constante para un ambiente interior sano	T4.a Filtración del aire de suministro
		T5. Refrigeración eficiente	T5.a Freecooling T5.b Enfriamiento adiabático
OPERACIÓN (O)	Operación	O1. Manual del usuario	
		O2. Medición del consumo	O2.a Control de todas las energías O2.b Control de temperatura y humedad

Tabla 1: Tabla de requisitos Minergie Chile

## 9.2 Pilotproject "Casa las Pataguas"

It is a single-family house developed by Chilean architect Cristian Izquierdo Lehmann. The house is located in La Dehesa district, in the metropolitan area of Santiago. The structure is mainly made of wood (Cross Laminated Timber - CLT), but there will also be some concrete areas to ensure thermal mass.

This project is in the pre-project phase and EBP (Chile and Switzerland), together with Minergie expert Armin Binz, has already been able to evaluate the architectural aspects and propose improvement measures, which have been retained by the client: Heat production with heat pump instead of gas boiler, more energy efficient windows, increased thickness of thermal insulation in the walls, installation of a mechanical ventilation system.



### **9.3 Pilotproject "Edificio Tallwood"**

EBP has proposed to Tallwood to participate in the development of Minergie Chile. Tallwood is one of the leading wood construction companies in Chile, and is interested in a possible collaboration. The pilot project is an 11-story wooden house project that is intended as a pilot project for the certification of Minergie Chile. The preliminary project is ready and could soon be pre-certified by EBP. The 21000 m<sup>2</sup> project in Coyhaique, Patagonia, foresees 68 apartments in a building where only the stairs will be made of concrete. The second floor will be occupied by offices and stores.



## 9.4 Licence agreement

The licence agreement is confidential. Therefore, only the pages with the tasks of the licensee (page 3) and the page with the signatures of the Minergie Association and the licensee are shown here (page 12).

# MINERGIE®

Bedingungen und Vorbehalte sind nur dann Vertragsbestandteil, wenn sie zwischen den Parteien im vorliegenden Vertrag oder in Anhängen und Nachträgen vereinbart wurden.

Sämtliche Änderungen und/oder Nachträge dieses Vertrages bedürfen zu ihrer Gültigkeit der Schriftform und soweit es sich nicht um einseitige Festlegungen / Weisungen des Lizenzgebers handelt der Unterzeichnung durch die Vertreter des Lizenzgebers und des Lizenznehmers.

### 4. Hauptaufgaben und Wirkungsfeld

#### 4.1 Führung der «Minergie-Agentur Chile», Leistungen

Der Lizenznehmer EBP Chile führt die Minergie-Agentur in Chile (nachfolgend «die Agentur»). Die Agentur ist berechtigt, im Vertragsgebiet gemäss den geltenden Reglementen von Minergie, Bauten nach den unter Punkt 4.2. erwähnten Minergie-Baustandards und Minergie-Modulen exklusiv zu zertifizieren, entsprechende Zertifikate auszustellen und die Einhaltung der Minergie-Standards zu überwachen. Zudem ist der Lizenznehmer für das Marketing und die Weiterbildung in Bezug auf Minergie im Vertragsgebiet exklusiv zuständig. Ebenso ist der Lizenznehmer exklusiv zuständig, chilenische Minergie-Fachpartner auszuzeichnen.

Die Agentur erbringt folgende Leistungen:

1. Gebäudezertifizierung (Wohnbauten, Gewerbebauten, Schulen usw.) →siehe dazu Ziff. 6
2. Beratungsleistungen im Vorfeld der Zertifizierung
3. Weiterbildung von Fachkräften in den Minergie-Themen in Kursen und Workshops →siehe dazu Ziff. 7
4. Marketing- und Kommunikationsleistungen, Vernetzung und Akquisition von Sponsoren →siehe dazu Ziff. 8
5. Auszeichnung von Bauteilen in Minergie-Qualität (Module) →siehe dazu Ziff. 10
6. Zertifizierung von Minergie-Fachpartnern →siehe dazu Ziff. 11

Der Lizenznehmer ist weiter berechtigt, die Marke «MINERGIE», mit oder ohne Zusätze für die jeweiligen Substandards, für eigene Werbeveranstaltungen im Zusammenhang mit energieeffizientem Bauen einzusetzen.

Die Erbringung von Leistungen ausserhalb der oben erwähnten Bereiche ist nach vorgängiger Absprache und Bewilligung des Vereins Minergie möglich, sofern die Grundsätze von Minergie erfüllt sind (vgl. Statuten).

#### 4.2 Zu zertifizierende Minergie-Baustandards

Namentlich werden die nachfolgend aufgeführten, markenrechtlich geschützten Minergie-Produkte von der Agentur angewendet:

- Minergie (chilenischer Standard)

Sollten während der Vertragsdauer weitere Standards für Chile entwickelt werden, fallen diese ebenfalls in die exklusive Zuständigkeit der Minergie-Agentur Chile. Gleiches gilt für die in der Schweiz bereits bestehenden Zusatzprodukte MQS Bau und MQS Betrieb.

Neu von Minergie für die Schweiz entwickelte Produkte können in der Regel auch von der Agentur Chile angeboten werden. Der Verein Minergie behält sich das Recht vor, für die Einführungsphase andere Auftragnehmer zu beauftragen. Diese Regelung gilt auch, wenn die Agentur Chile die notwendigen fachlichen Fähigkeiten nicht nachweisen kann.

## 14.4 Anwendbares Recht/Gerichtsstand

Auf das Vertragsverhältnis ist schweizerisches Recht anwendbar. Der Gerichtsstand ist der jeweilige Sitz des Vereins MINERGIE, derzeit Basel (Schweiz).

Ort, Datum: *Santiago, 13.05.2021*

Verein MINERGIE

  
Regierungsrat Marc Mächler  
Präsident

  
Andreas Meyer Primavesi  
Geschäftsleiter

Ort, Datum: *Santiago de Chile, 13.05.2021*

EBP Chile SpA

Nicola Borregaard  
Nicola Borregaard  
Gerente General  
GeschäftsleiterIn

Firmado digitalmente por Nicola Borregaard  
DN: cn=Nicola Borregaard, c=CL,  
o=EBP Chile,  
email=nicola.borregaard@ebpchile.cl,  
Fecha: 2021.05.19 15:02:50 -0300

Ort, Datum: *Zürich, 17.8.2021*

EBP Schweiz AG

  
Christoph Zulauf  
CEO/Geschäftsleitung

  
Heinz Richter  
Geschäftsleitung/Partner

Anhänge:

- Anhang 1: Aktionsplan
- Anhang 2: Budgetplanung 2022-2025
- Anhang 3: Investitionsplan

Beilagen:

- A. Statuten Verein Minergie
- B. Nutzungsreglement Minergie (Schweiz)
- C. Produktereglement Minergie Chile

## 9.5 Business plan

The business plan is confidential. Therefore, only the page with the table of contents is shown here.

### Índice

1.	Introducción (WR, 1p)	1
2.	Minergie Internacional: Lecciones aprendidas (revisión equipo, 1p)	2
3.	Análisis del entorno en Chile (AEP, 2p, revisión equipo)	3
1.1	Marco legal y sistemas de incentivos financieros	3
2.2	Programas nacionales en la construcción eficiente	4
3.3	Actores claves del mercado de construcción	5
4.4	Certificaciones	6
5.5	Materiales, productos y tecnologías existentes	7
4.	Modelo de negocio y servicios (NIB, 2p, incluir las recomendaciones del taller)	9
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4.4	Unidades del mercado	24
5.5	USP (WR, Revisión del equipo)	25
5.	Equipo, organización y alianzas (WR, 2p)	26
1.1	Equipo	26
2.2	Organización	26
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6.	Mercado y Marketing (2p)	30
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7.	Riesgos y oportunidades (WR, revisión equipo, 1p)	32
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8.	Plan de acción (AEP, 1p)	34
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2.2	Financiamiento y liquidez	37
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2.2	Estado actual	37

## 9.6 Basis documents for certification

### Online Platform Minergie Chile

The online platform is used to register projects (<https://international.minergie.ch>). All information about the project is entered online. The certification body checks the projects on this platform.

### Excel-Tool for calculations "Ficha Minergie"

An Excel tool was developed for calculations required by the Minergie Standard Chile and is available on the online platform. This Excel must be filled out by the applicants and uploaded to the online platform.

Aislamiento térmico de la envolvente		
Componente	Valor U (W/m <sup>2</sup> *k)	Tipo de acción
Muro 1	0,8	llenar
Muro 2	0,5	llenar
Muro 3	0,3	llenar
Muro 4		llenar
Muro 5		llenar
Techumbre 1		llenar
Techumbre 2		llenar
Techumbre 3		llenar
Piso 1		llenar
Piso 2		llenar
Piso 3		llenar
Ventana 1		llenar
Ventana 2		llenar
Ventana 3		llenar
Puerta 1		llenar
Puerta 2		llenar

Zonas climáticas	Contra el clima exterior		Contra espacios no condicionados y terreno	
	Componentes opacas (Muros, techumbres, pisos) <sup>a</sup>	Ventanas y puertas	Componentes opacas (Muros, techumbres, pisos)	Ventanas y puertas
A Norte Litoral	0.4 (0.6)	1.9	0.6	3.0
B Norte Interior	0.4 (0.6)	1.9	0.6	3.0
C Central Litoral	0.3 (0.5)	1.9	0.4	3.0
D Central Interior	0.3 (0.5)	1.9	0.4	3.0
E Sur Litoral	0.25	1.9	0.4	3.0
F Sur Interior	0.25	1.9	0.3	3.0
G Sur	0.25	1.9	0.3	3.0
H Andina	0.18	1.9	0.3	3.0
I Extremo Sur	0.18	1.9	0.3	3.0

Tabla 1: Valores límite de transmitancia térmica U [W/(m<sup>2</sup>\*K)] para las zonas climáticas de Chile. Los valores entre paréntesis se aplican a los muros exteriores de construcción sólida (p.ej. ladrillo, hormigón, etc.). Los valores indicados aplican para una construcción de opacidad de 2 o más de 2 y pueden ser atenuados para opacidades menores a 2. (a) El cumplimiento es por elemento y no por cerramiento.

## User manual

The user manual helps the applicant to create the Minergie project and is available on the online platform in the help documents section. Due to its size, only an excerpt is shown here.

### Ejemplos

Los ejemplos que se muestran a continuación han sido calculados en base a la norma [NCh 853 2007](#), el formato utilizado puede ser de elaboración propia, la herramienta de cálculo de DITEC o la memoria de cálculo de la CEV.

Ejemplo 1: Cálculo de valor U de tabique de madera (construcción ligera heterogénea):

El ejemplo utilizado trata de un muro de madera de estructura liviana en base a pies derechos de 90X41 con aislamiento térmico colocado entre pies derechos, el aislante térmico es celulosa de 26 kg/m<sup>3</sup> de densidad y 9 cm de espesor.

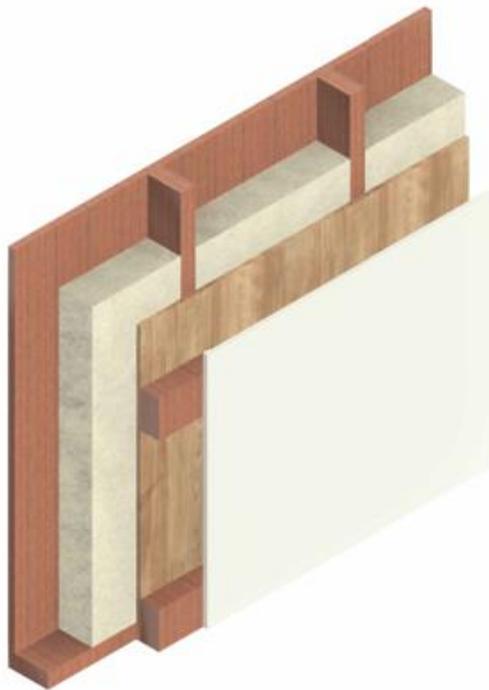


Figura 2 Ejemplo muro tabique de madera

## 9.7 Trainings

The first basic course was held on 17 - 18.3.2022. The participants were trained as Minergie experts and can now submit projects for Minergie certification. The course program can be found on the website (<https://www.minergie.cl/es/trainings/?l>).

**MINERGIE**<sup>®</sup> Noticias Ejemplo edificaciones Minergie

Construir mejor, vivir mejor. Minergie Chile ¿Por qué Minergie? Certificación

# Capacitaciones

Minergie ofrece un curso de formación para profesionales que quieran convertirse en "Expertos Minergie" para desarrollar y asesorar edificaciones Minergie.

El curso básico "Edificación como un todo", se compone de 2 etapas:

- **1era Etapa: Edificación como un todo, Autoaprendizaje:** Conceptos básicos sobre eficiencia energética, confort térmico, calidad del ambiente interior, energías renovables e impactos ambientales.  
  
Herramientas: Videos E-learning, documentos de apoyo, Reglamento Minergie, autoevaluaciones.
- **2da Etapa: Edificación como un todo, Clases interactivas:** Sesiones grupales con profesores especialistas en cada temática. Revisión y profundización de conceptos, estrategias de diseño para alcanzar los requisitos del estándar Minergie, aplicación práctica de herramientas de verificación, taller de asesoría y revisión de un ejemplo.  
  
Herramientas: Manual de aplicación Minergie, Herramientas de verificación, presentaciones, bibliografía de apoyo.

El certificado Experto/a Minergie, se obtiene una vez finalizadas y aprobadas ambas etapas del curso básico.

## Curso básico

- Detalles e inscripción: [Link](#)

**Edificación como un todo, Autoaprendizaje:**

- Fecha: Disponible desde el 1 de febrero 2022. Cierre el 1 de marzo del 2022
- Lugar: Online

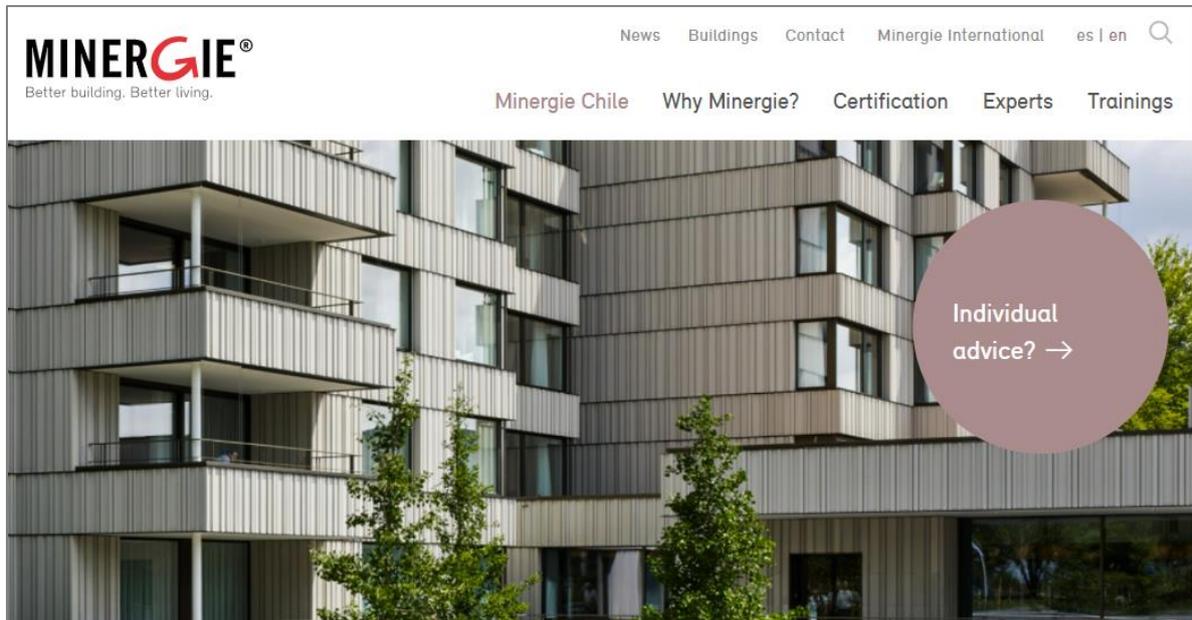
**Edificación como un todo, Clases interactivas:**

- Fecha: 17.03.22 & 18.03.22, 09:00-13:00
- Lugar: Online

## 9.8 Marketing

### Website

The Minergie Chile website (<https://www.minergie.cl/>) contains all the information on the benefits of Minergie, the certification process, news, current courses, etc. The website is available in English and Spanish.

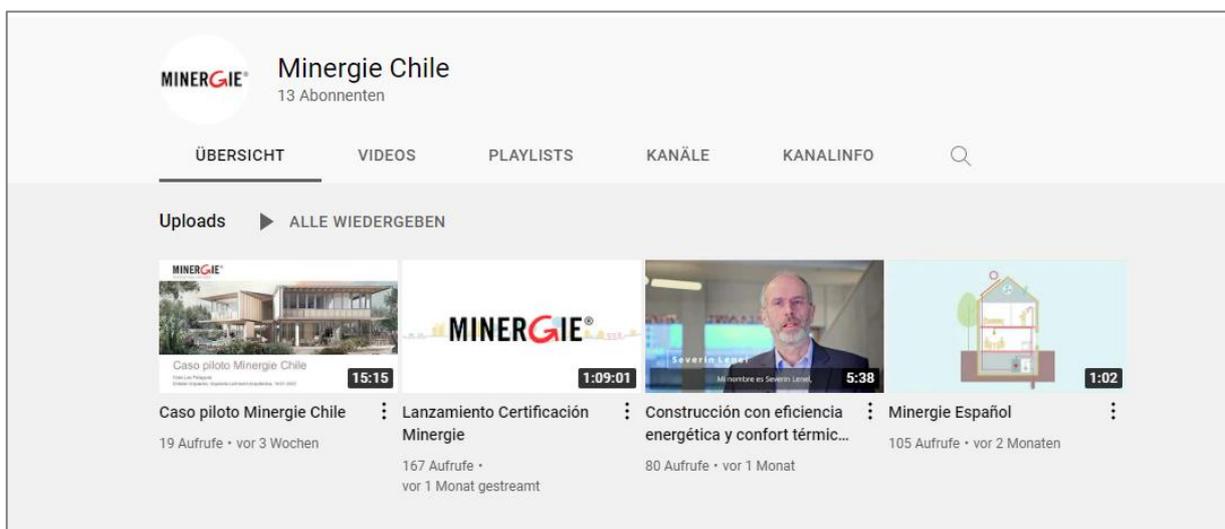


### Videos

The following videos were created for marketing purposes:

- [Construcción con eficiencia energética y confort térmico – un ejemplo de Minergie](#)
- [Minergie Chile explicado brevemente](#)
- Expo Clean Tech: One more videoclip will be shot in March 2022 at the Expo "Clean Tech" in the metro station Nuñoa, Santiago. Minergie is presented on a poster at this Expo. The film shall show the importance of sustainable construction (Minergie) and the role of technology. Therefore, various potential partners from the industry (window manufacturers, manufacturers of PV systems, etc.) will be interviewed at the expo site. This video is currently being implemented.

All publicly accessible videos are published on the YouTube channel of Minergie Chile (<https://www.youtube.com/channel/UCUWnmedbRHfEWLQtFJ7sUYw>).



## Launch event

An official launch event for the implementation of Minergie in Chile was held on 19 January 2022. Over 50 people took part in the event. Among others, the Swiss ambassador, representatives of the Ministry of Housing and the Ministry of Energy, as well as the architect of the pilot project spoke about the importance of Minergie in Chile. The entire event was recorded and is available here: <https://youtu.be/9t03bQmlh44>.

## La certificación de origen suizo MINERGIE® llegó a Chile!

Los invitamos a participar en el **lanzamiento** de Minergie, un sello de construcción sustentable, que asegura calidad del ambiente interior, confort térmico y un mínimo gasto de energía.

### PROGRAMA

19/01/2022\_11:00 a 12:00

- 11:00 - Bienvenida
- 11:05 - Breves palabras del Embajador de Suiza en Chile, Arno Wicki
- 11:10 - Breves palabras del Ministerio de Vivienda y Urbanismo / Marcelo Soto
- 11:15 - Breves palabras del Ministerio de Energía / Nicolás Pintor
- 11:20 - ¿Qué es Minergie y cómo se integra a nuestro país? / Nicola Borregaard, EBP Chile
- 11:25 - Experiencia en Suiza / Andreas Meyer, Director Minergie Suiza
- 11:35 - Aplicación de Minergie en Chile / Monserrat Bobadilla, EBP Chile
- 11:45 - Caso piloto / Cristian Izquierdo, Izquierdo Lehmann Arquitectos
- 11:55 - Lanzamiento primer curso para Expertos Minergie / Monserrat Bobadilla, EBP Chile

Moderadora: Monserrat Bobadilla\_EBP

Transmisión en vivo Youtube live @minergiechile

