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# Digital Readiness Chile

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This study has been developed by professionals of Fundación País Digital, upon request from CISCO, United States.

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# Digital Readiness *for the fourth* industrial revolution



Over the last decades, innovation and the increase of technological development have brought profound changes in the different areas of society. Clearly, the so-called fourth Industrial Revolution positions itself as one of the most profound and significant changes in recent times. From here, digital transformation becomes a key factor in the development of countries and their citizens.

The process of digital transformation has manifested itself as an unprecedented event, changing relationships in society, in both public and private areas. For example, companies have improved efficiency in their processes, modifying from production to potential customers linkage. People, on their part, have change the way they communicate with each other, the way they inform themselves and the type of work that they do.

Public and private sectors have made a series of efforts for readiness and adaptation to digital transformation, therefore it's crucial to perform an accurate diagnosis of the reality that countries live in, in order to conduct the tasks to be developed in accordance with all the strong and weak points of each region. Consequently, this report has been set up as a technical input that is intended to measure Digital Readiness in Chile, with particular attention to each one of the areas of the national territory.

It is worth pointing out that Chilean territory is divided into 16 regions. In this context, the focus of this study will be the regional administrative divisions in order to define each territory in terms of Digital Readiness and by this, accurately opening new fields of action and intervention that will enable the process of digital

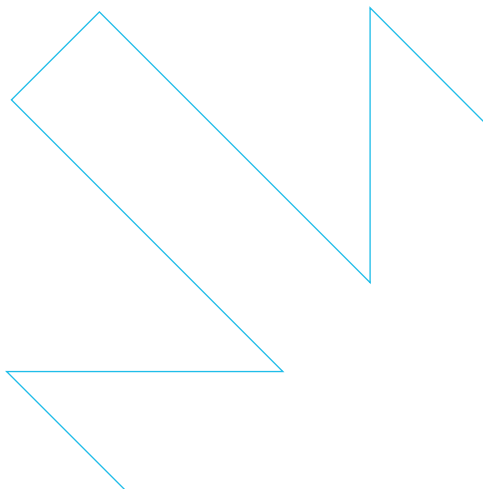
transformation of the country. The study was formulated on the basis of specific methodological criteria and processes, result of the conditions and features detailed below. Following this, the results will be presented by the total of the country regions and will end with remarks and recommendations relevant to the particular characteristics of Chile.



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# Methodology, understanding digital readiness in Chile

This report follows the methodological criteria of Country Digital Readiness: Research to Determine a Country's Digital Readiness and Key Interventions (CISCO, 2018), that acknowledges the existence of three Digital Readiness stages: Activation (basic level), Acceleration (intermediate level) and Amplification (highest level). In this document, in turn, are defined seven areas that make Digital Readiness possible to quantify. Therefore, in the case of Chile, analyzed dimensions and indicators are configured as follows:



# Methodology, understanding digital readiness in Chile

## Chile's digital readiness index

### 01 → Technological Infrastructure



→ The infrastructure available to enable digital activities and connected consumers (IoT, Cloud).

#### Indicators

- Fixed Internet connections per household
- High speed Internet availability
- Capacity of renewable energy facilities
- Reliability of the power system

### 02 → Technological Adoption



→ Demand for digital products / services.

#### Indicators

- Internet users
- Households with computer
- Households with mobile devices (smartphone, tablet, others)

### 03 → Human Capital



→ Availability of labor force trained to support digital innovation (build and maintain).

#### Indicators

- People from 0 to 14 years old
- Labor force participation
- Tertiary education
- Math knowledge of students

### 04 → Basic Needs



→ Basic needs for the welfare of the population.

#### Indicators

- Life expectancy at birth
- Child mortality
- Poverty rate
- Homeless people

### 05 → Ease of doing business



→ Basic infrastructure / necessary policies to support business continuity.

#### Indicators

- Patents applications
- Total number of companies
- Record of end of line of business
- Government expenditure on transportation

### 06 → Business and Government Investment



→ Private and public investment in technology and innovation.

#### Indicators

- Foreign direct investment
- Expenditure in business R&D
- Expenditure in state R&D

### 07 → Start-up Environment



→ Environment that encourages innovation within a community.

#### Indicators

- New business density
- Incubators
- Trademarks applications

# ➤ Geographical configuration of Chile

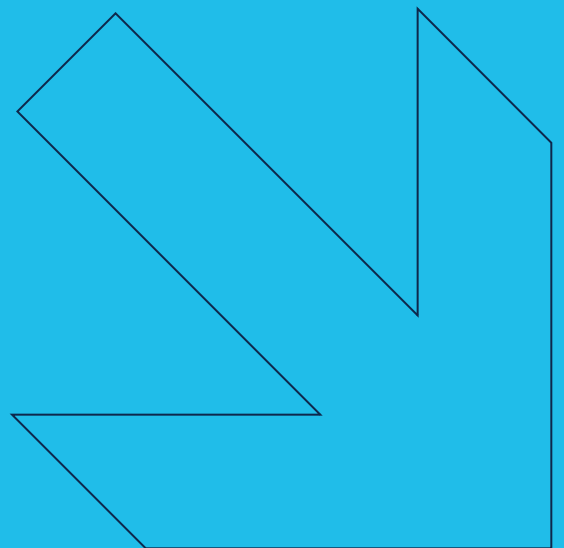
The geographical configuration of Chile allows generally locating the 16 regions or territorial political-administrative units of the country from north to south. Following this logic, these units are listed as follows: Arica and Parinacota Region, Tarapacá Region, Antofagasta Region, Atacama Region, Coquimbo Region, Valparaíso Region, Metropolitan Region, O'Higgins Region, Maule Region, Ñuble Region, Biobío Region, Araucanía Region, Los Ríos Region, Los Lagos Region, Aysén del General Carlos Ibáñez del Campo Region, and Magallanes Region and Chilean Antarctic.

It is important to point out from the total distribution of regions that the administrative unit of Ñuble was created in 2017 and came into force in 2018, reason why there's still not enough data to be included in the present Digital Readiness Index. This region arose from the division of the Biobío Region territory, therefore, as follows below, the presentation of the results per region shows 15 of the 16 regions, where Ñuble and Biobío division are presented as annexes, with the information gathered so far.





# Digital Readiness of Chile



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# Chile

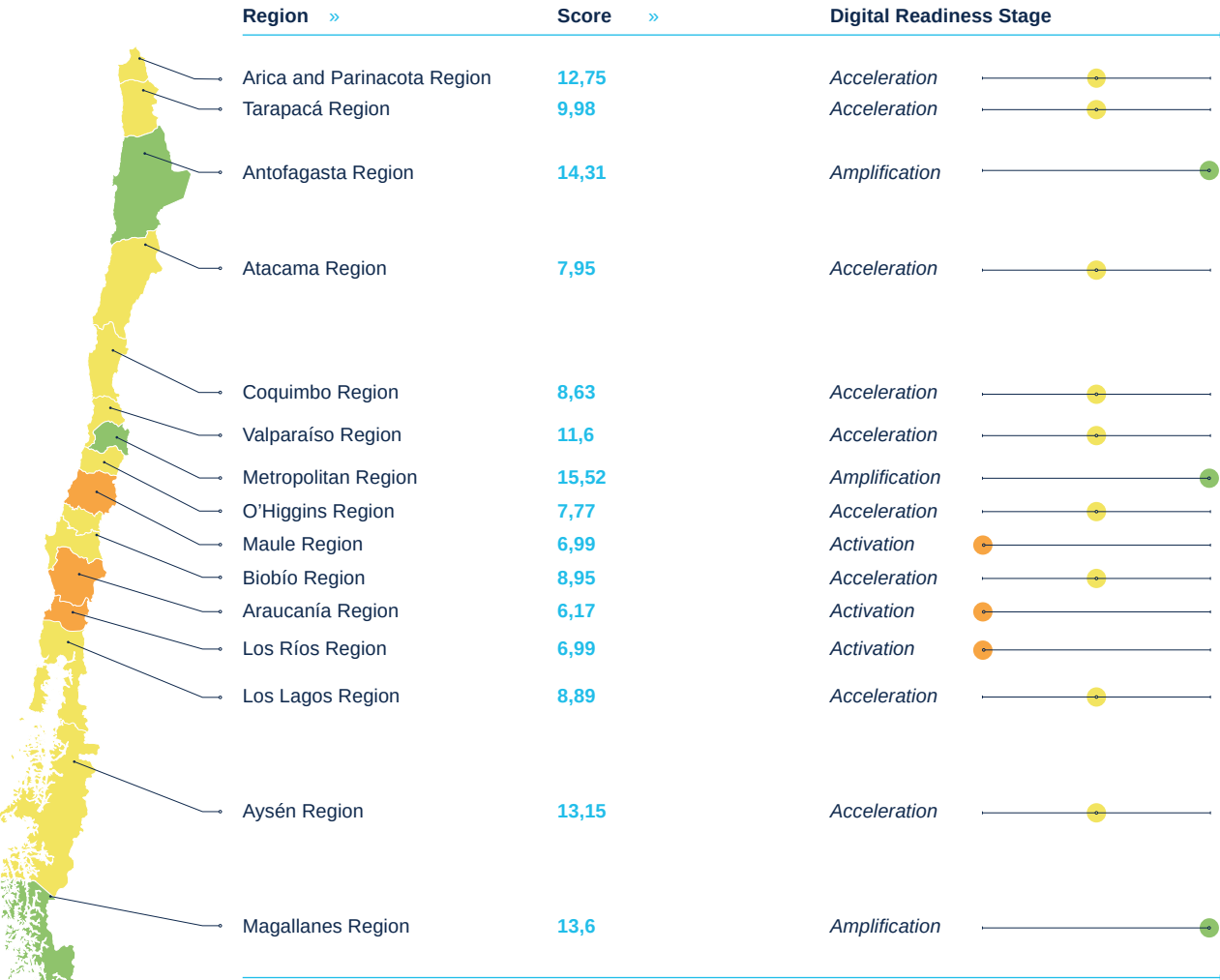


▲ Cordillera de los Andes, Chile

# Chile

The Digital Readiness Index of the Chilean regions was calculated according to the result they obtained in each of the 7 dimensions mentioned above. A total of 25 points was set as a theoretical maximum, which represents that the territory is fully prepared for digital transformation.

According to the results, the highest score was obtained by the Metropolitan Region with 15.52 points, and the lowest, the Araucanía Region, with only 6.17 points. Next, the score of each of the regions is detailed, indicating the Digital Readiness stage that represents each result:



With the scores, a ranking of 1 to 15 was generated, where 1 is the region most prepared for the digital transformation and 15, the one with the lowest installed capacities.

- 1 — Metropolitan Region
- 2 — Antofagasta Region
- 3 — Magallanes Region
- 4 — Aysén Region
- 5 — Arica and Parinacota Region
- 6 — Valparaíso Region
- 7 — Tarapacá Region
- 8 — Biobío Region
- 9 — Los Lagos Region
- 10 — Coquimbo Region
- 11 — Atacama Region
- 12 — O'Higgins Region
- 13 — Maule Region
- 14 — Los Ríos Region
- 15 — Araucanía Region

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# Arica and Parinacota Region



▲ Putre, Arica and Parinacota Region, Chile



# Arica and Parinacota Region

Arica and Parinacota Region is located at the northern end of the country, bordering Perú and Bolivia. It is populated by a total of 226,068 inhabitants (according to Instituto Nacional de Estadísticas: INE, 2017), equivalent to 1.3% of the total population of the country, which places it in the third lowest position in relation to population proportion per region in Chile.

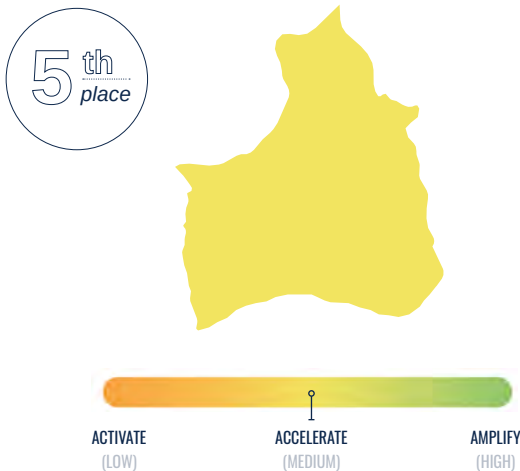
Based on economic data of this region, the gross domestic product (GDP) of this administrative unit is ranked 14th among the 15 regions of the country. In figures, GDP for the year 2017 in Arica and Parinacota reached a total of 1,388 million of Chilean pesos, which is equivalent to 0.85% of the total national GDP.

The region is settled in a favorable position for the development of trade infrastructure and transportation, mainly because of two facts. Firstly, Arica and Parinacota is located between two free trade zones, towards the north of the region, is the Peruvian free trade zone of Tacna and towards south is Iquique (Tarapacá Region). Secondly, Arica, the capital city of the region has a port area, which places it as the geographically northern trading and maritime transport region of the national territory.

Regarding Digital Readiness of the region, and according to the total of regions, it ranks 5th, making a total of 12.75 points, reaching the intermediate level. Particularly, among the elements of Digital Readiness, the region stands out for the development of technological infrastructure. Its results are above the national average in relation to the percentage of fixed Internet connection subscriptions in households, high speed Internet, power generation in renewable energy stations and stability of the power system.



## Digital Readiness Ranking Position, Arica and Parinacota Region



## Ranking of dimensions of Digital Readiness



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# Tarapacá Region



▲ Cancosa, Pica, Tarapacá Region, Chile

# Tarapacá Region

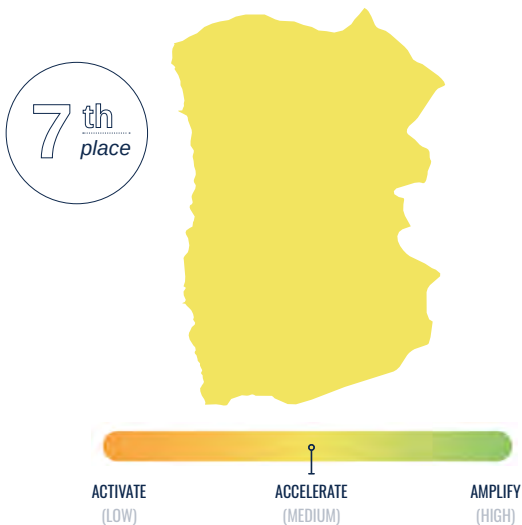
Tarapacá Region is the second region located at the northern end of the country. It borders Arica and Parinacota Region to the north, Bolivia to the east and Antofagasta Region to the south. It is populated by a total of 330,558 inhabitants (INE, 2017), equivalent to 1.88% of the total population of the country, which places it in the 11th position in relation to the total national population.

In economic terms, the GDP of Tarapacá is ranked 11th among the other regions of the country. The GDP for the year 2017 reached a total of 4,033 million of Chilean pesos, equivalent to 2.48% of the total national GDP.

The region is characterized by two focal points of extraction of economic resources; mining and commercial fishing. It also has a free trade zone, granting the exemption from income taxes for accrued income on companies and from VAT (Value Added Tax), by selling and services provided.

Regarding Digital Readiness of the region, and according to the total of regions, it ranks 7th, making a total of 9.98 points, reaching the intermediate level. Particularly, among the elements of Digital Readiness, the region stands out for the development of the human capital dimension. Its results are above the national average in relation to the proportion of inhabitants from 0 to 14 years old, the percentage of labor participation and the number of people that has tertiary education.

## Digital Readiness Ranking Position, Tarapacá Region



## Ranking of dimensions of Digital Readiness



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# Antofagasta Region



▲ Ruta 23, Calama, Antofagasta Region, Chile

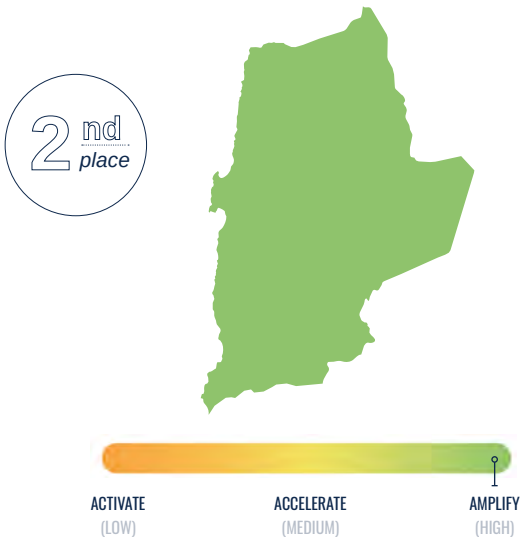
# Antofagasta Region

Antofagasta Region is one of the regions that is located in Norte Grande of the country, bordering with Tarapacá Region to the north, Bolivia and Argentina to the northeast and Atacama Region to the south. It is populated by a total of 607,534 inhabitants, a figure equivalent to 3.5% of the total population of the country. In reference to data delivered by CENSUS 2017, Antofagasta Region is placed in the 9th position in relation to the total national population.

In economic terms, the GDP of Antofagasta on 2017 reached a total of 15,979 million of Chilean pesos. This region has the major copper mining activity of the country, this places it in the second place, equivalent to 9.82% of the total national GDP.

Regarding Digital Readiness of the region, and according to the total of regions, it ranks 2nd, making a total of 14.31 points, reaching the highest level. Particularly, among the elements of Digital Readiness, the region stands out in the dimensions of technological infrastructure and business and government investment. Regarding technological infrastructure dimension the results are above the national average in indicators such as rate of households with Internet fixed connection, rate of households with high speed Internet and the capacity of generating renewable electric energy.

## Digital Readiness Ranking Position, Antofagasta Region

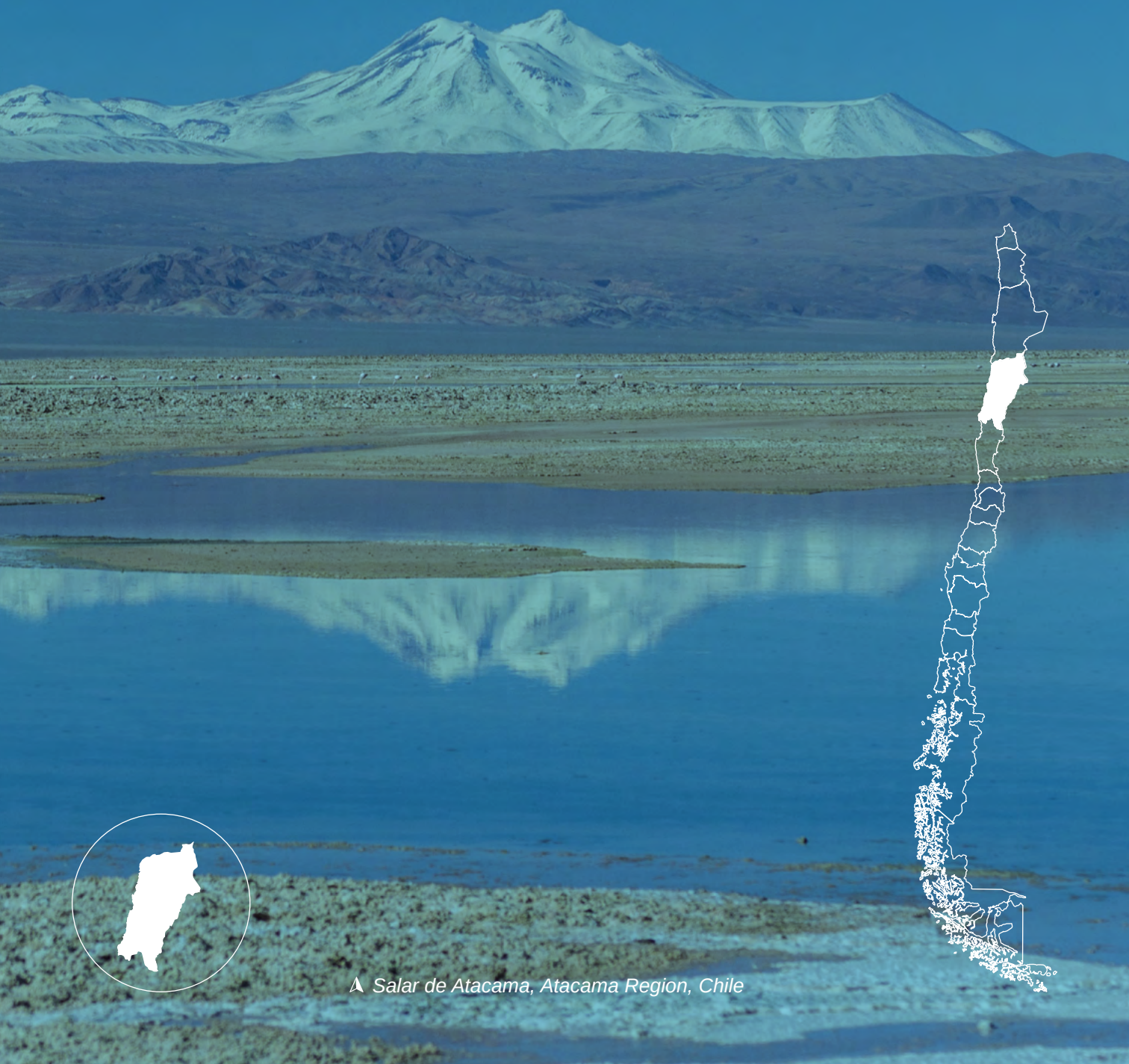


## Ranking of dimensions of Digital Readiness



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# Atacama Region



▲ Salar de Atacama, Atacama Region, Chile

# Atacama Region

Atacama Region is located in the north of Norte Chico of the country. It borders Antofagasta Region to the north, Argentina to the east and Coquimbo Region to the south. It is populated by a total of 286,168 inhabitants, a figure equivalent to 1.6% of the total population of the country, placing it in the 12th position, making it one of the four least populated regions of Chile.

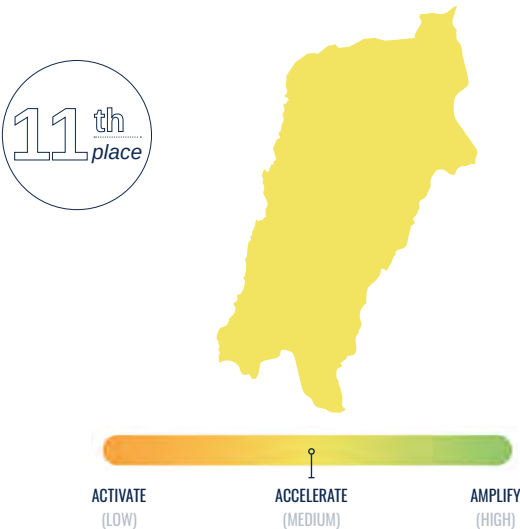
According to economic data of this region, the GDP of this administrative unit is ranked 10th among the 16 regions of the country. Particularly, the GDP on 2017 reached a total of 4,132 million of Chilean pesos, equivalent to 2.54% of the total national GDP.

In terms of economic development of the region, likewise other regions of the north of Chile, it is defined for the mining activity, especially copper and iron. Besides, there's also the export of table grape and agricultural olive production.

Regarding Digital Readiness Index of Atacama Region, it is ranked 11th, making a total of 7.95 points, reaching the intermediate level. One of the outstanding dimensions, over the national average, is technological infrastructure, particularly the high capacity installed to generate non-conventional renewable energy.



## Digital Readiness Ranking Position, Atacama Region

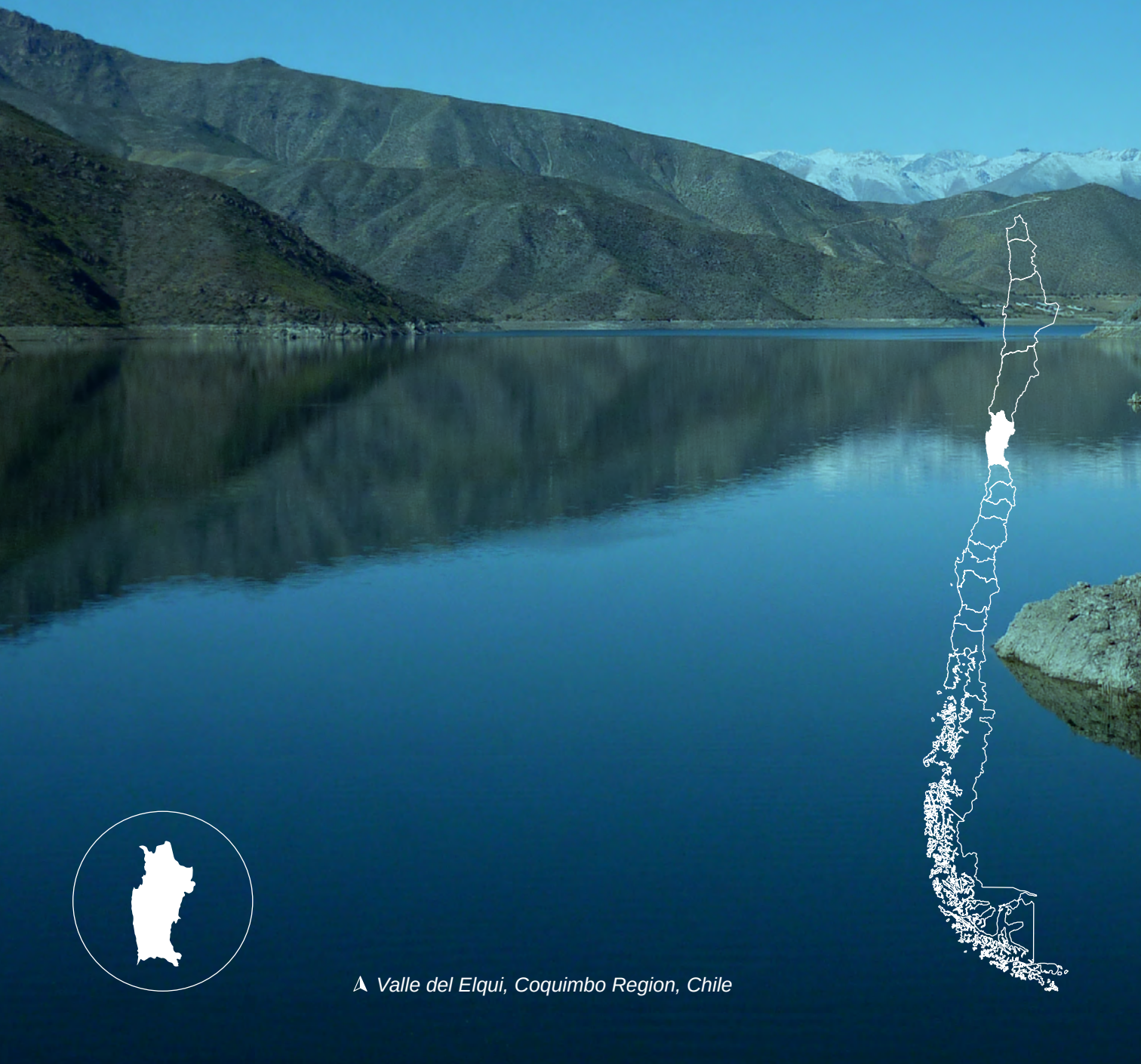


## Ranking of dimensions of Digital Readiness



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# Coquimbo Region



▲ Valle del Elqui, Coquimbo Region, Chile

# Coquimbo Region

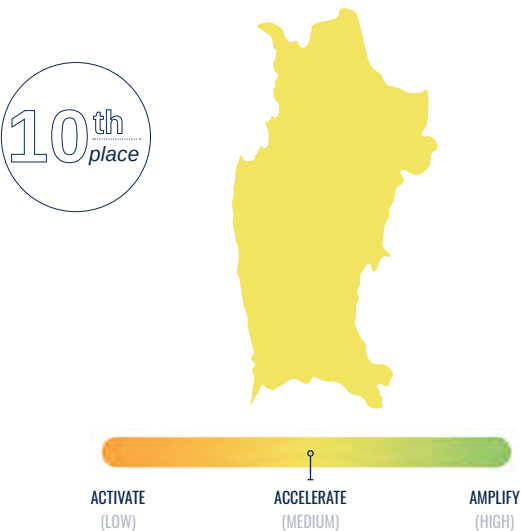
Coquimbo Region is located in Norte Chico of the country; it borders Atacama Region to the north, Argentina to the east and Valparaíso Region to the south. According to statistical data, the region had 757,586 inhabitants by the year 2017, figure equivalent to 4.3% of the national population, placing the region in the 8th position among the total of the country.

According to economic data, the GDP of this region reached a total of 5,025 million of Chilean pesos. This ranks the region 8th among the other regions of the country, equivalent to 3.09% of the total national GDP.

Coquimbo Region focuses its economic development in three main activities: mining, agriculture and fishing. Mining takes place in Los Pelambres, Andacollo and Romeral. As for agriculture, it is mainly performed in Valle de Elqui. Finally, fishing is developed across all the seashore of the country, resulting in a strong incentive for the regional development

Regarding Digital Readiness Index of the region, it is ranked 10th from the total regions, making a total of 8.63 points, reaching the intermediate level. Particularly, among Digital Readiness elements, outstanding indicators are in the dimensions of basic needs, with specific attention to the low rate of income poverty of the population.

## Digital Readiness Ranking Position, Coquimbo Region

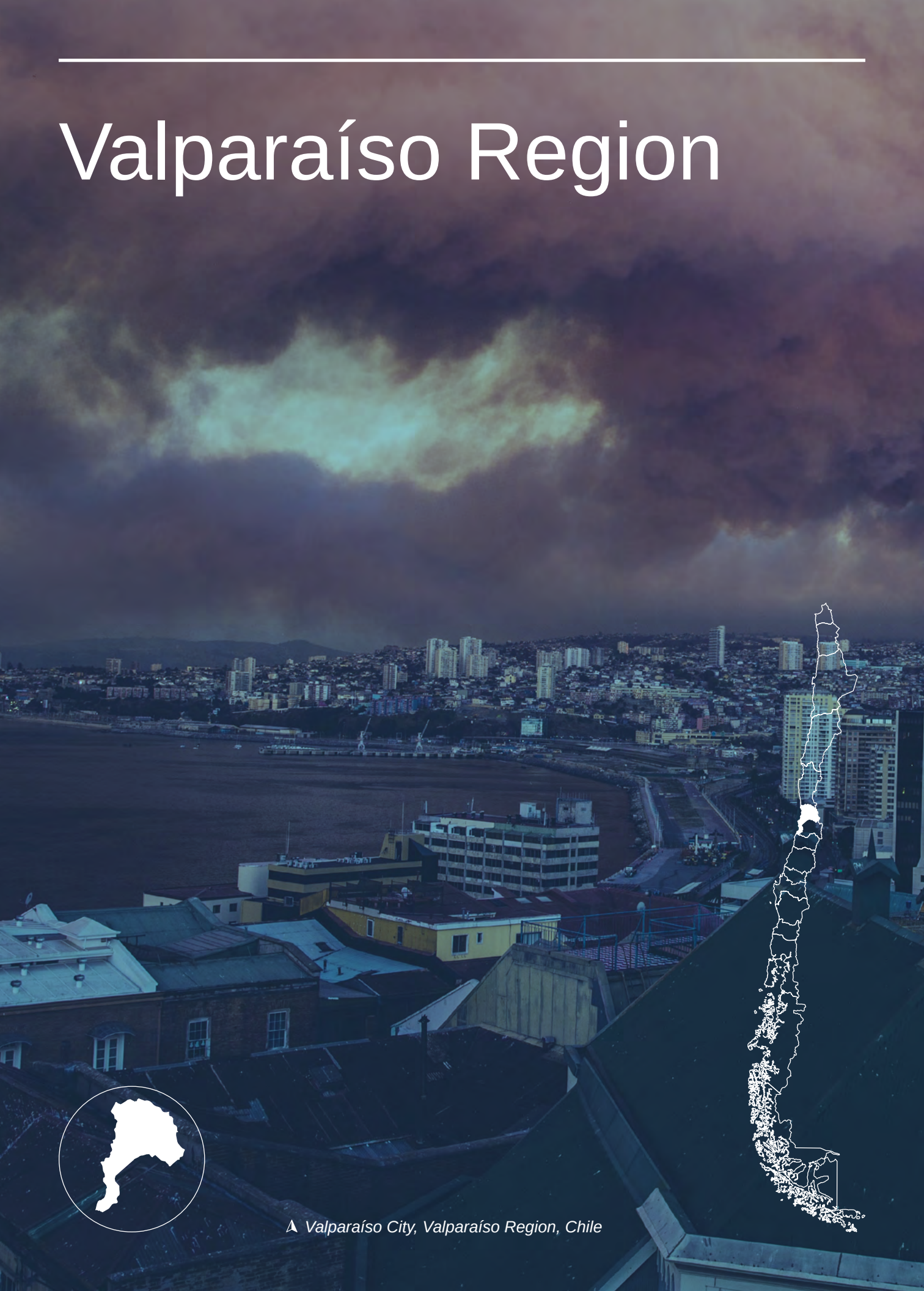


## Ranking of dimensions of Digital Readiness



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# Valparaíso Region



▲ Valparaíso City, Valparaíso Region, Chile

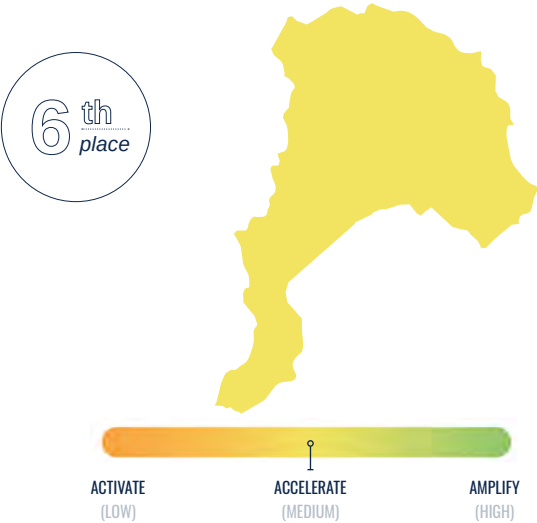
Valparaíso Region is located in the central zone of Chile; it borders Coquimbo Region to the north, Argentina to the east, Metropolitan Region to the south-east and O'Higgins Region to the south. According to statistics, the region is populated by 1,815,902 inhabitants, equivalent to 10.3% of the total population of the country. It is the third region with the highest population density.

In terms of economic data, the GDP of Valparaíso Region on 2017 reached 15,517 million of Chilean pesos, figure equivalent to 9.54% of the total of the country. In this manner, the region is ranked 3rd among the other regions of Chile.

Valparaíso Region has one the main ports of the country. In addition, other outstanding activities are mining (districts of Los Andes and Puchuncaví), agriculture (export of table grape) and fishing (production of fishmeal).

Regarding the Digital Readiness Index of the region, it is ranked 6th from the total regions, making a total of 11.16 points, reaching the intermediate level. Particularly, among Digital Readiness elements, outstanding elements are in the dimensions of technological adoption, especially the high percentage of Internet users and households with computer.

Digital Readiness Ranking Position, Valparaíso Region



Ranking of dimensions of Digital Readiness



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# Metropolitan Region



▲ Santiago City, Metropolitan Region, Chile

# Metropolitan Region

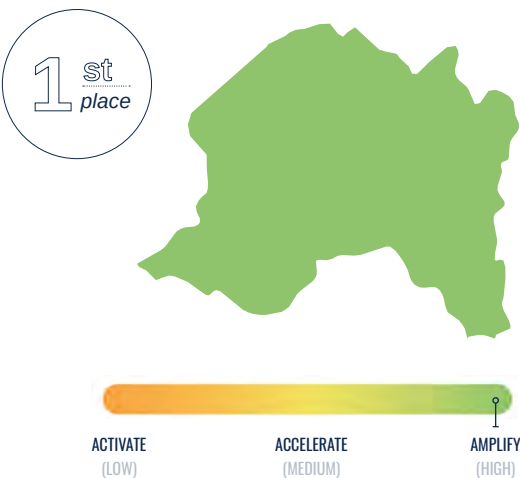
Metropolitan Region is located in the macro central zone of Chile; it borders Valparaíso Region to the north and west, Argentina to the east and O'Higgins Region to the south. This region gathers the highest population density, it is populated by 7,036,792 inhabitants (INE, 2017), equivalent to 40.5% of all the country.

In economic terms, the GDP of the region reaches 74,833 million of Chilean pesos annually, equivalent to 46.01%, ranking the region first from all the other regions.

Metropolitan Region outstands for its diverse urban infrastructure, reflected in business, the public administration and in educational facilities. As for trade, here is located the Bolsa de Comercio de Santiago (Santiago Stock Exchange), the main trading center of Chile and the head office of the most important companies of the country. In terms of public administration, it acts as headquarter of the main judicial bodies (Supreme Court) and executive ones (Government House, Ministries, Subsecretariats). Finally, in educational terms, here are located the most important higher education institutions of Chile (Universidad de Chile and Pontificia Universidad Católica de Chile).

Regarding the Digital Readiness Index of the region, it is ranked first, with a total of 15.52 points, reaching the highest level. The region stands out for having high records in the dimensions of human capital and ease of doing business. According to the first, there is a high percentage of the number of inhabitants that have tertiary education and high scores in the Math SIMCE test (Education Quality Measurement System) from 4th elementary grade and second year of secondary school students. As for the second one, it is seen in the high number of patents applications and in government expenditure on transportation.

## Digital Readiness Ranking Position, Metropolitan Region



## Ranking of dimensions of Digital Readiness



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# O'Higgins Region



▲ *San Fernando, O'Higgins Region, Chile*

# O'Higgins Region

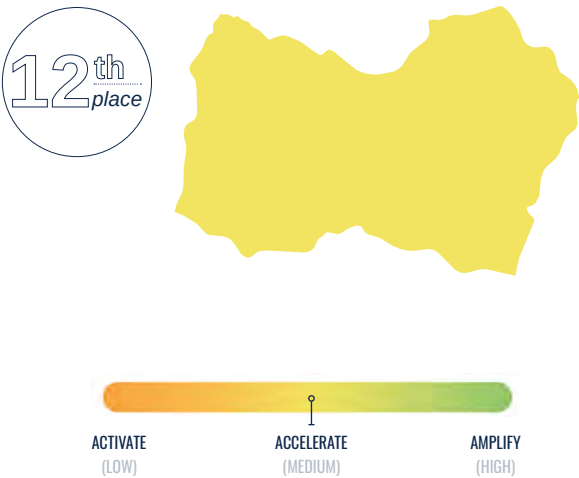
O'Higgins Region is located in the central zone of Chile; it borders Metropolitan Region to the northeast, Valparaíso Region to the northwest, Argentina to the east and Maule Region to the south. According to the figures of the census of 2017, the region is populated by 914,555 inhabitants, equivalent to 5.2% of the total population. O'Higgins region is ranked 6th, making it one of the most populated regions.

In terms of economic data, the GDP of O'Higgins Region is ranked 5th among the other regions of Chile. Specifically, the GDP on 2017 reached a total of 8,044 million of Chilean pesos equivalent to 4.95% of the total national territory.

Like other regions of Chile, the economic development of the region focuses on mining, due to the location of the most important copper mine; El Teniente. In addition, other activities take place, like agriculture and food processing industry thanks to the Mediterranean climate of the region.

Regarding the Digital Readiness Index of the region, it is ranked 12th from the total regions, making a total of 7.77 points, reaching the intermediate level. One of the outstanding dimensions, over the national average, is technological infrastructure, particularly in what refers to the generation of unconventional renewable energy.

## Digital Readiness Ranking Position, O'Higgins Region



## Ranking of dimensions of Digital Readiness



# Maule Region



▲ *Parque Nacional 7 Tazas, Maule Region*



# Maule Region

Maule Region borders O'Higgins Region to the north, Argentina to the east and Biobío Region to the south. According to data of the census of 2017, the region is populated by 1,044,950 inhabitants, equivalent to 5.9% of the total population of the country. Subsequently, this is the fourth most populated region of Chile.

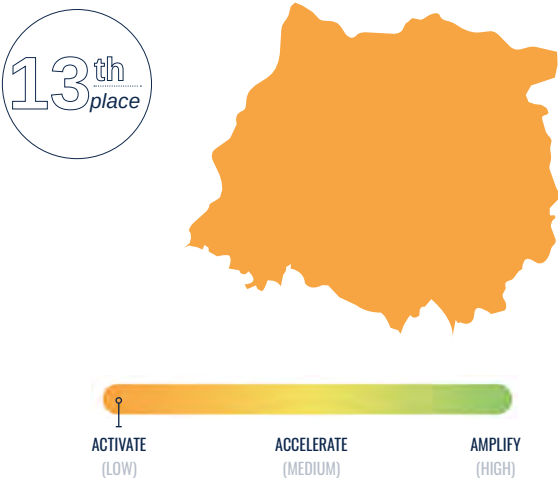
In economic terms, the GDP of the region reached a total of 5,852 million of Chilean pesos on 2017, figure equivalent to 3.6% of the total national territory. This region ranks 7th in economic contribution terms.

Maule Region developing activities are forestry and fishing, main sources of labor for its population. In addition, it also take place other activities linked to heavy industry (artillery), oil refinery and agricultural development of cereals and vegetables.

Focusing on the analysis of Digital Readiness, Maule Region is ranked 13th with a total of 6.99 points, reaching the lowest level. However, the region stands out for the proportion of patents applications and the number of companies.



## Digital Readiness Ranking Position, Maule Region



## Ranking of dimensions of Digital Readiness



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# Biobío Region



▲ Altos del Biobío, Biobío Region, Chile

# Biobío Region

The region is located in the center-south zone of Chile; it borders Maule Region to the north, Argentina to the east and Araucanía Region to the south. It is populated by 2,037,414 inhabitants (INE, 2017), equivalent to 11.6% from the total national of the country, making it the second most populated region of the Chile.

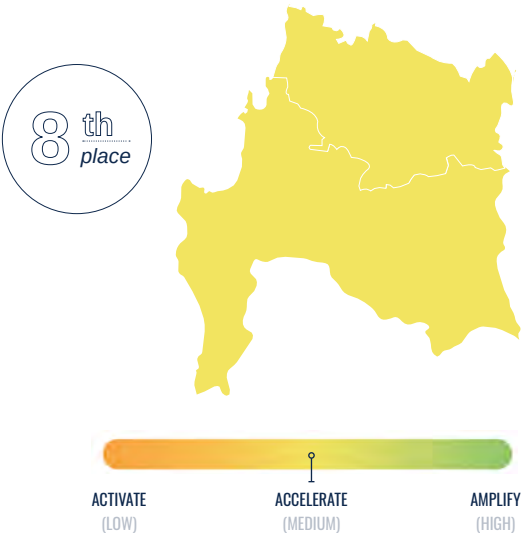
According to economic data, the GDP of the region on 2017 ranks it 4th among the other regions of the country. In figures, it reaches 13,497 million of Chilean pesos, equivalent to 8.3% of the total national territory.

Among the outstanding economic activities of the region are forestry, fishing and manufacturing. In addition, highlight points are agricultural development and the power generation industry through hydroelectric plants.

Concerning the Digital Readiness Index, Biobío Region is ranked 8th, with a total of 8.95 points, reaching the intermediate level. This region has the development of elements that technically evaluate the ease of doing business. It stands out the proportion of patents applications and the government expenditure on transportation.



## Digital Readiness Ranking Position, Biobío Region



## Ranking of dimensions of Digital Readiness



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# Araucanía Region



▲ Volcán Villarrica, Araucanía Region, Chile

# Araucanía Region

Araucanía Region is located in the south of Chile, bordering Biobío Region to the north, Argentina to the east and Los Ríos Region to the south. According to the 2017 census, it has a population of 957,224 inhabitants, figure translated in the 5.4% of the national population and it is in the 5th position as regards the total national territory.

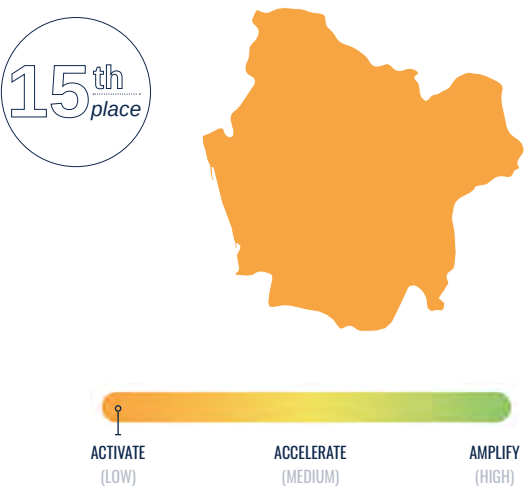
As for microeconomic indicators, the GDP of the region reaches 4,694 million of Chilean pesos; this, equivalent to 2.89% of the total GDP of the country and ranks the region 9th.

Araucanía Region outstands for developing mainly a primary economy, focusing on agriculture (oats, barley and potato crops) and livestock (bovine). In addition, there's a strong touristic area, this, because of lakes, volcanoes and national parks in its territory.

Finally, regarding the Digital Readiness Index, the region is ranked 15th, with a total of 6.17 points. This, positions it in the lowest level, but the region has potential relative to the dimension of Start-up Environment.



## Digital Readiness Ranking Position, Araucanía Region



## Ranking of dimensions of Digital Readiness





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# Los Ríos Region



▲ Parque Peumayen, Los Ríos Region, Chile

# Los Ríos Region

Los Ríos Region is located in the south of the country; it borders Araucanía Region to the north, Argentina to the east and Los Lagos Region to the south. It is populated by 384,837 inhabitants, equivalent to 2.2% of the total population of the country, reaching the 10th position as regards to the proportion of inhabitants per region in Chile.

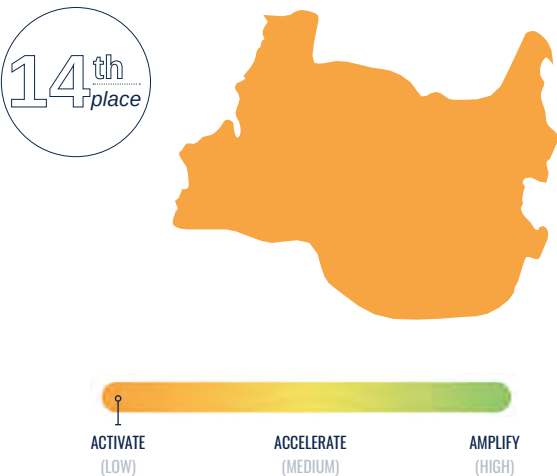
According to economic data, the GDP on 2017 of Los Ríos Region reached a total of 2,382 million of Chilean pesos, figure equivalent to 1.46% of the national total. This, positions the region 12th in terms of its financial contribution.

Like its neighboring regions, Los Ríos outstands for the development of primary activities such as agriculture and livestock. In addition, there's an important source of production linked to forestry, intended for timber extraction and paper production.

Finally, regarding the Digital Readiness Index, the region is ranked 14th, with a total of 6.99 points. This, positions it in the lowest level, but the region outstands for its records, above the national average, of public and private investment, particularly of expenditure in research and development.



## Digital Readiness Ranking Position, Los Ríos Region



## Ranking of dimensions of Digital Readiness



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# Los Lagos Region



▲ Frutillar, Los Lagos Region, Chile

# Los Lagos Region

Los Lagos Region is located in the south of the country; it borders Los Ríos Region to the north, Argentina to the east and Aysén region to the south. According to statistical data of 2017, it has a population of 828,708 inhabitants (INE), figure equivalent to 4.7% of the total national population. The region is ranked 7th.

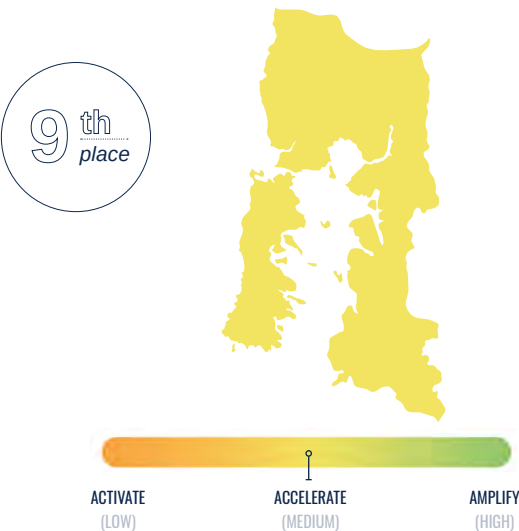
As regards to economic measurements, the GDP of the region on 2017 reached 6,174 million of Chilean pesos. The region is in the 6th position in relation to its income, representing 3.8% of the national territory.

The capital of Los Lagos region is Puerto Montt, a city that makes the start point for the Chilean Patagonia. The region develops activities linked to the primary sector of economy (livestock, agriculture and forestry), together with an important business source linked to salmon farming and its derivatives.

Regarding the Digital Readiness Index, the region is ranked 9th, with a total of 8.89 points, positioning it in the intermediate level. The region outstands for the area linked to the ease of doing business, this, for its high percentage in the generation of patents per capita, the number of created companies and public expenditure in transportation per inhabitant.



## Digital Readiness Ranking Position, Los Lagos Region



## Ranking of dimensions of Digital Readiness



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# Aysén Region



▲ *Cochrane, Aysén Region, Chile*



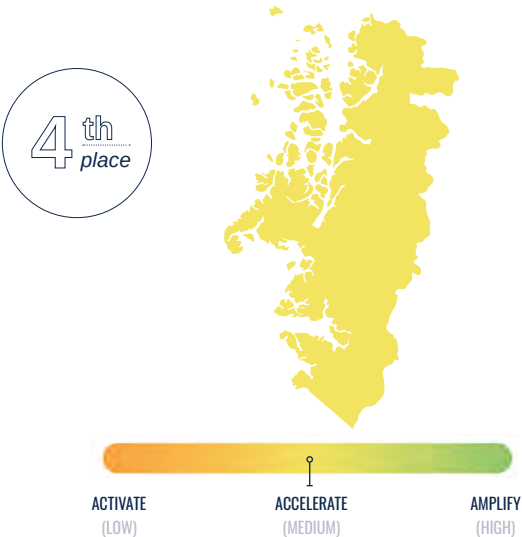
Aysén Region is located in the south of Chile, specifically in the area known as Chilean Patagonia. It borders Los Lagos Region to the north, Argentina to the east and Magallanes Region and Chilean Antarctica to the south. According to 2017 Census, the region is populated by 103,158 inhabitants, equivalent to 0.6% of the total national population. This, makes Aysén Region the least populated of the country.

Concerning economic data, the GDP of the region is in the 15th position among the other regions of the country. GDP on 2017 in the case of this administrative unit reached 1,090 million of Chilean pesos, figure equivalent to 0.67% of the national GDP.

Aysén Region is the place with the largest amount of freshwater of Chile; it also has the third worldwide largest Continental ice field. While half of its territory hosts protected wildlife areas, in the rest of the territory are developed economic activities such as agriculture, livestock, forestry, fishing and tourism. On this last point, it is necessary to mention Carretera Austral (Southern Road) with more than 800 km providing the opportunity to fully know the Chilean Patagonia.

Focusing on the Digital Readiness Index, the region is ranked 4th, with a total of 13.15 points. The region outstands in the areas of public and private investment and ease of doing business. According to this, there's high rate of public investment and R&D per capita, and data that show new business per people and public expenditure in transport.

Digital Readiness Ranking Position, Aysén Region



Ranking of dimensions of Digital Readiness



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# Magallanes Region



▲ Parque Nacional, Torres del Paine, Magallanes Region, Chile

# Magallanes Region

Magallanes Region and Chilean Antarctica are located in southern Patagonia, bordering Aysén Region to the north, Argentina to the east and the South Pole to the south. According to Census of 2017, the region is populated by 166,533 inhabitants, figure equivalent to 0.9% of the national population, positioning the region number 14 from the rest of the country.

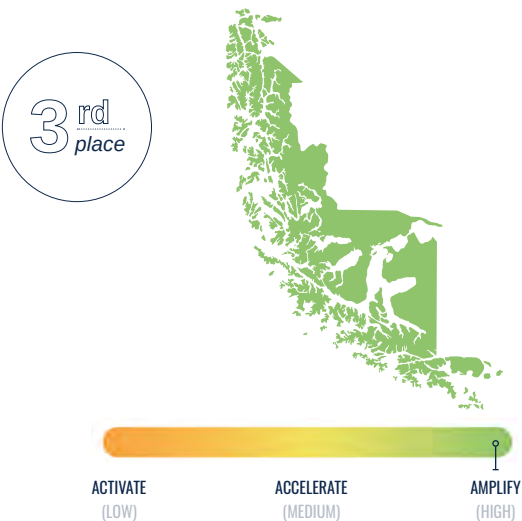
According to economic variables, the GDP of the region reaches 1,904 million of Chilean pesos. This ranks the region 13th in relation to the rest of the country, position equivalent to 1.17% of the total national GDP.

Due to the environmental conditions of the region, it stands for the development of livestock and mining (oil, gas and coal), and not for agricultural activity. Concerning tourism, the region hosts Torres del Paine National Park, one of the most important touristic attractions of the country and the eighth wonder of the world.

Finally, regarding the Index of Digital Readiness, the region is ranked 3rd, with a total of 13.6 points. Even though it is the southernmost region of Chile and the continent, it outstands for the high rate in technological adoption, translated into high percentages of Internet users, number of households with computer and mobile devices.



## Digital Readiness Ranking Position, Magallanes Region



## Ranking of dimensions of Digital Readiness



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# Closing Remarks

Chile's economic and social growth have positioned the country in an intermediate level of Digital Readiness, this means in the stage of Acceleration. According to Country Digital Readiness: Research to Determine a Country's Digital Readiness and Key Interventions (CISCO, 2018), in order to move on to a higher level or reach the Amplification stage, Chile would have to make business easier, increase the investment in human capital and work for meeting the basic needs. Particularly, among all the regions of the country, it is observed that certain indicators show substantial differences in their increase or decrease, depending on the indicator. This should help to clarify new action points, challenges and opportunities that support the national analysis and the previous recommendations of CISCO, enabling a development focused on territory.

**Analyzing each one of the dimensions that are part of the Digital Readiness, it is worth to mention the following about the regions belonging to Continental Chile:**



## Technological Infrastructure:

Digital Readiness considers the development of available technological infrastructure that meets the present and future needs of all matrix users through the country. As defined in the analyzed records and the selected metrics and according to data obtained from official sources, it is established that in Chile has existed and still exists a sustained growth of the percentage of fixed Internet connection at home, high speed Internet availability, and electrical system reliability. However, comparing all the regions, there are significant differences in infrastructure availability. Considering that in all households, data traffic and usage are often higher than this usage in mobile devices; thus, also given the new platforms and services offered by Internet, the country must make progress in the deployment of infrastructure based on optical

fiber and high speed. In parallel to this, progress in the increase of capacity of renewable energy must take place in order to benefit the digital matrix and all the energy-intensive industries, as well as the citizenship with sustainable energy matrix, directly contributing to the country's sustainable development. In this context, it is recommended to generate contingency plans and risk planning processes to address cases of force majeure that may exist in the energy or digital matrix in Chile, aiming to submit annual indicators of the country's situation, measurements in minutes, this, already done by developed countries.



## Technological Adoption:

Technological adoption is formed by required goods and/or services, acknowledging everyday use by the citizenship. The country has made significant progress in the percentage of users connected to Internet and technological devices availability (computers, tablets and others), this, because of an increased competition, a decrease in prices, the massive import of technological products from Free Trade Agreements, among other factors. Today in Chile, there are more connections through smartphones than citizens. However, present and future challenges and regional differences are conditioned by socioeconomic factors, which have provoked that the curve of digital technology adoption (internet or smartphone) to reach a point of saturation for a large portion of the population. The other portion (that don't have these technological goods or services), is conditioned by their level of education, socioeconomic income, age and where they live (urban or rural area), this, according to our analysis based on growth data and determinants of Internet and digital technologies. This is why a progressive and emphatic path must be established in the population that has poor availability to access or use this digital technology and, not only that, but also urgently to start addressing the efficient use, with knowledge and responsibility, of these digital goods or services, as well as their contents for the population.

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## Closing Remarks



### Human Capital

The digital growth of a country, and in order to face the challenges of the XXI century, requires a population capable of using digital technology. According to the analyzed data, children from 0 to 14 years old must have the basic Math knowledge that allows computational thinking and abilities of the XXI century. Today, beyond regional indicators, it is necessary to make comparisons among districts, where clearly are differences in the educational level and a critical challenge for our future country, beginning from primary education. In addition, a high and steady percentage of the population with tertiary education is needed to participate in labor market and also this people must have the technical and advanced knowledge of this fast-moving market thanks to digital technology. Today there are more than 5 million of Chilean people that have not finished high school, this is translated in types of work without high qualification, with a high replacement potential due to labor automation. For this reason, Chile must create technology and knowledge, not only to be a consumer, in order to have more efficiency and effectiveness in the use of ICT, it is necessary and urgent to foster digital readiness and education of the country from its grounding for the years to come.



### Basic Needs

A country with digital readiness primarily requires meeting the basic needs of its population. At this point, Chile outstands for the high life expectancy at birth of the population and a low infant mortality rate, also compared with international standards. Internally, the differences in these indicators are better reflected by comparing districts with different socio-economic, cultural and demographic features and people's quality of life, generating differences in life expectancy of men and women up to 10 years old among the districts of the same region, as in the case of the Metropolitan Region.



In order to increase this area, efforts must be concentrated to reduce poverty, not only at an income level, but in a wider and multidimensional context that directly have an impact on these basal indicators, as well as in the rate of homeless people, although a low percentage of the population, but has accumulated disadvantage levels that do not allow to have the benefit of the environmental basic needs, neither the full use of this digital technology.



### Ease for doing business

Based on the studied element, Digital Readiness is correlated with the ease or difficulties in the environment for the development of new business, situation that Chile must work on. The country outstands for presenting throughout the territory, considerable differences both in the number of patents applications, as well as, conditioned by diverse economic and social factors of regions, in the number of present companies in our country, according to people of working age of the respective region. Besides, this disparity is complemented with the end of line of business that varies between 1 and 3% per year, with regard to the total companies per region, being this one of the key indicators of conditions and opportunities of the regional Chilean market associated to economic cycles, along with the creation of companies, indicator present in the start-up environment dimension. It is also observed that government expenditure on transportation per capita, is several times higher in certain regions than others, it is conditioned by the size of projects in certain regions with lack of connectivity or by large urban construction sites, factors that affect the ease of logistics chains and shipping and reception of goods throughout the territory, for all the industries of the country, from small to large companies. Region by region, Chile must establish a clear path to make and do business easier, which considers from encouraging creation and innovation that lead to patenting, and therefore, the registration of new companies or spin-offs, to generating concrete actions that allow reducing the mortality rate of regional companies, particularly of micro companies, it must provide quality transport networks for the traffic of a citizenship that interacts with market, and also for suppliers, importers and exporters from our country.

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## Closing *Remarks*



### Business and Government Investment

Chile has a low rate of investment on research and development; it is generally ranked among the last positions compared to OECD countries, which makes it difficult for the availability of the necessary conditions for fostering Digital Readiness towards a higher level and a progressive transition to a developed country. In Chile, foreign direct investment and expenditure in R&D of companies is severely conditioned to big cities, companies and higher historical performance industries of Chile, however, still deficient for the needs of the XXI century and a diversification of the productive matrix of the country. For this reason, foreign direct investment opportunities and expenditure in R&D must be encouraged at a public and private level throughout the country, specially focusing on companies and industries that will enhance growth, development and increase of the added value to economy, facing the challenges of the XXI century and the impact of digital technology on society.



### Clima empreendedor

Entrepreneurs and startups are key players in the digital development of a country, because they stand out for a strong element of creation of ideas and innovation, mostly based on technology and strongly intensive in digital technology, which is translated into new business models, official trademarks registration and activation or updating of ecosystems of companies in the market. Entrepreneur ecosystem in Chile has had steady strengthening for years, with major initiatives and total support of the public and private sector. Meanwhile, business incubators have arisen throughout the years that have enabled boosting and encouragement of multiple hundreds of diverse category and industry businesses. Business accelerators, not measured in this study, have also contributed to this mission. It is worth mentioning that survival rate of national companies, according to the information of the Central Bank of Chile and the Ministry of Economy, reaches 60% at the fourth year of life and that companies survive the “valley of death”. However, this percentage is affected depending on the eco-

nomic sector and size of the company. In this respect, micro companies have high mortality rates in relation to larger companies, approximately only 40% of micro companies live at least 7 years. In this context, it is essential that the rate of new businesses increases and to do so, the development of the entrepreneur ecosystem, from the public and private sector, along with the promotion and support of entrepreneurs and business incubators and accelerators and subsequently form organizations of venture capital, are key factors to make this happen and to directly favor growth, employment and the development of the country.

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# Conclusions

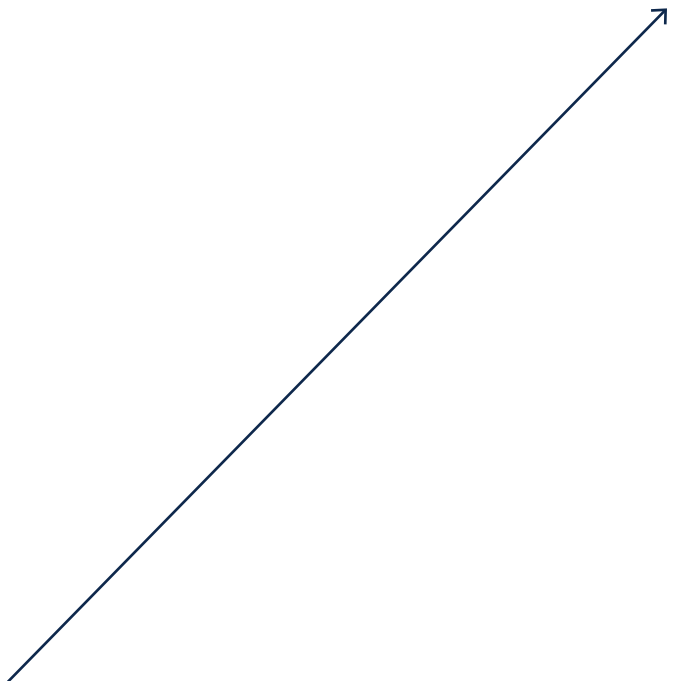
The fourth Industrial Revolution, in general, establishes new regulations of the economic and social ecosystem for all governments, companies and citizenship. Today, a country that is not prepared for the new human-machine relationship will be left out of all benefits implied by its use.

According to the global report of CISCO on Digital Readiness, Chile has been evaluated and placed in the stage of Acceleration, ranking it second over Latin America. However, this “acceleration” within the country is fragmented, concentrated with uneven growth. Currently, there still are regions that are taking advantage of and receiving their benefits, meanwhile others, are still in an early stage, producing different levels of inequality at territorial level.

In order to improve its levels in Digital Readiness, Chile must develop public policies based on technical evidence, with the aim of encourage Digital Readiness in accordance with framework conditions of each zone of Chile, adapting to their requirements and particular characteristics. This report analyzes seven critical dimensions of Digital Readiness that all society actors need to face the challenges of the XXI century. This, will not only allow creating a digitally prepared society, but also will contribute in the creation of a more equal and just society with higher social welfare.

In the past, Chile has had a late participation in industrial revolutions, concentrating its financial ef-

forts in the development of industries with low added value. Nevertheless, the current conditions of the country have allowed placing Chile in an advantageous position, with the potential to lead the fourth Industrial Revolution, for the sake of a higher social equity for all the national territory.



Ñuble Region

Ñuble Region was created on September 5th of 2017 and went into effect on September 6th of 2018. This region arises from the old province of Ñuble that belonged to the territorial political-administrative unit of Biobío Region. It is located at the south of the country; it borders Maule Region to the north, Biobío Region to the south and Argentina to the east.

According to statistical data of 2017 Census, the region is populated by 480,609 inhabitants, equivalent to 2.7% of the national population.

Since the region was created on 2018 as a political-administrative unit, there are only few pieces of information of the indicators that are part of the founding dimensions of Digital Readiness measurements. Collected data are detailed as follows:



Available Record of Ñuble Region, according to dimensions and indicators of the Digital Readiness Index.

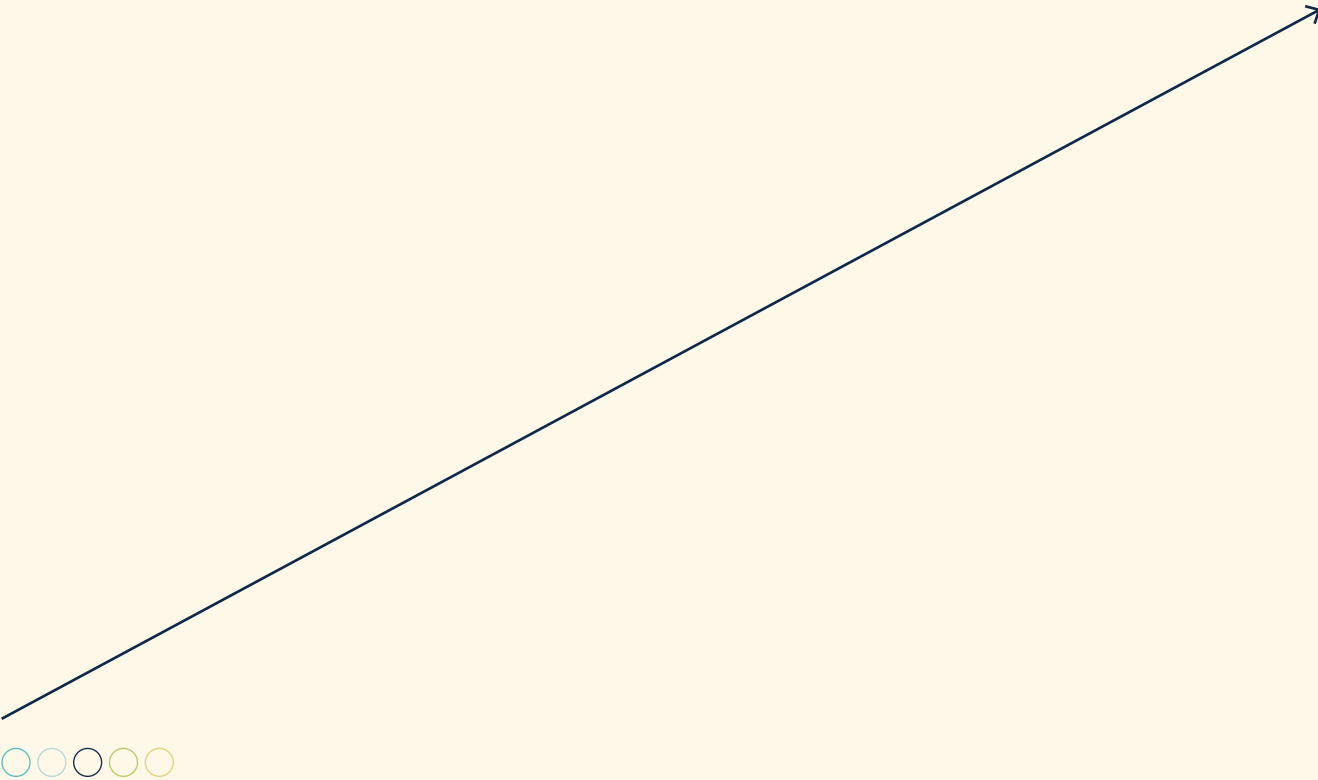
Categories	Indicators	Figures
Technological Infrastructure	Fixed Internet connections per household	n.i.
	High speed Internet availability	n.i.
	Capacity of renewable energy facilities	19,35
	Reliability of the power system	n.i.
Technological Adoption	Internet users	59,90%
	Households with computer	47,70%
	Households with mobile devices (smartphone, tablet, others)	50,30%
Human Capital	People from 0 to 14 years old	19,50%
	Labor force participation	57%
	Tertiary education	17,40%
	Math knowledge of students, Basic Education*	n.i.
	Math knowledge of students, Middle School Education*	n.i.
Basic Needs	Life expectancy at birth	n.i.
	Child mortality	n.i.
	Poverty rate	16,10%
	Homeless people	n.i.



Annex

Ease for doing Business	Patents applications	0,42
	Total number of companies	832,87
	Record of end of line of business	1%
	Government expenditure on transportation	n.i.
Public and Private Investment	Foreign direct investment	n.i.
	Expenditure in business R&D	1.081
	Expenditure in state R&D	n.i.
Start-up Environment	New business density	76
	Incubators	n.i.
	Trademarks applications	1,98

Note: n.i. = No information; \*= Both variables behave as a single metric in the Index of Digital Readiness, through a simple average of both values.



Biobío Region, new territorial political-administrative division

The new division of the political-administrative unit Biobío borders Ñuble Region to the north, Argentina to the east and Araucanía Region to the south. According to data from Census of 2017, the region is populated by 1,556,805 inhabitants, equivalent to

8.9% of the national population, which places it number three of the most populated regions.

Because of the separation that took place on September, 2018, between Biobío and Ñuble Regions, partial data of the region's new configuration are detailed below:



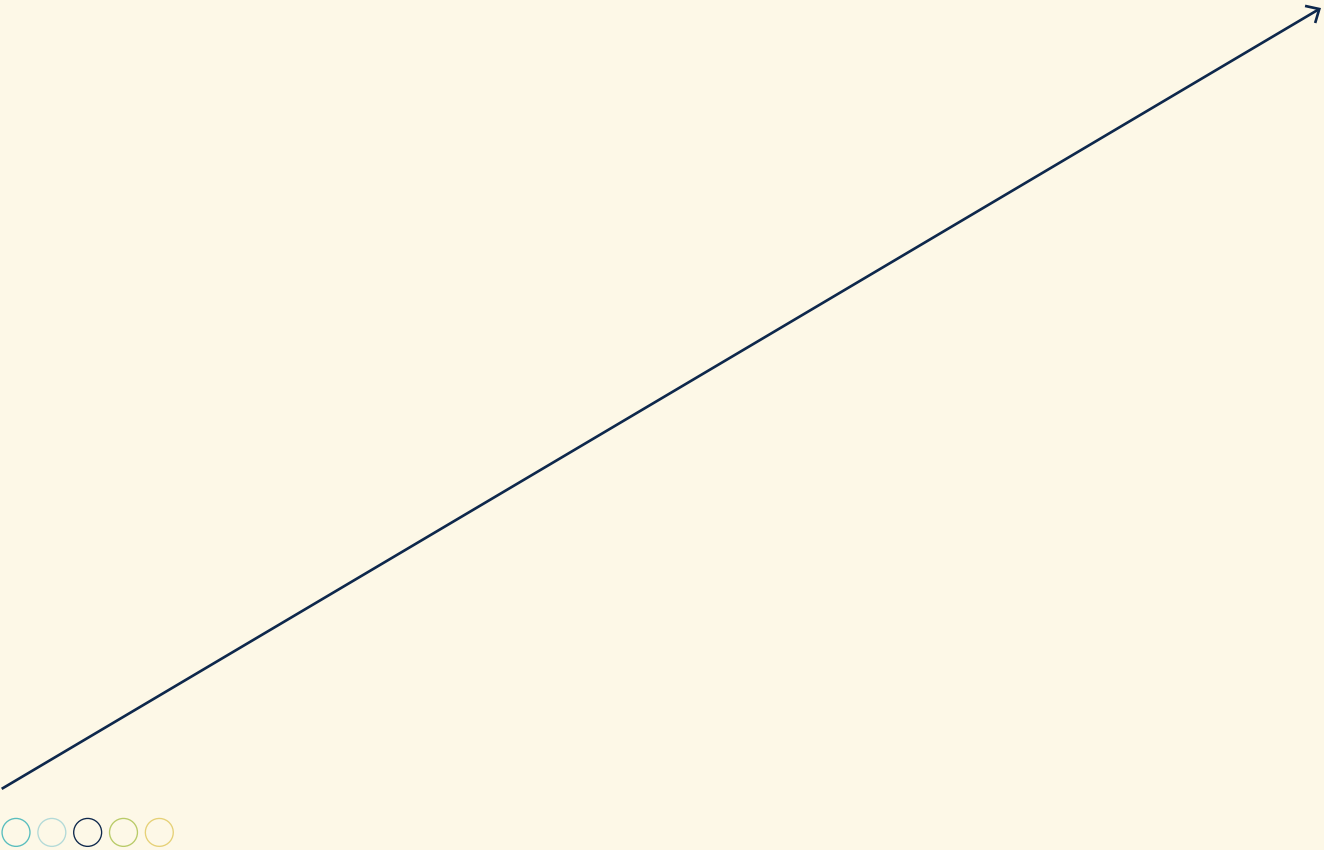
Available Record of Biobío Region, according to dimensions and indicators of the Digital Readiness Index

Categories	Indicators	Figures
Technological Infrastructure	Fixed Internet connections per household	n.i.
	High speed Internet availability	n.i.
	Capacity of renewable energy facilities	19,22
	Reliability of the power system	n.i.
Technological Adoption	Internet users	69,6%
	Households with computer	55,2%
	Households with mobile devices (smartphone, tablet, others)	55,3%
Human Capital	People from 0 to 14 years old	20,3%
	Labor force participation	53,4%
	Tertiary education	23,40%
	Math knowledge of students, Basic Education*	n.i.
	Math knowledge of students, Middle School Education*	n.i.
Basic Needs	Life expectancy at birth	n.i.
	Child mortality	n.i.
	Poverty rate	12,3%
	Homeless people	n.i.

Annex

Ease for doing Business	Patents applications	3,08
	Total number of companies	650,57
	Record of end of line of business	1,6%
	Government expenditure on transportation	n.i.
Public and Private Invest- ment	Foreign direct investment	n.i.
	Expenditure in business R&D	48.137
	Expenditure in state R&D	n.i.
Start-up Environment	New business density	69
	Incubators	0,060
	Trademarks applications	5,59

Note: n.i. = No Information; \*= Both variables behave as a single metric in the Index of Digital Readiness, through a simple average of both values.



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# Digital Readiness Chile

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## About Fundación País Digital

Fundación País Digital is an non-profit organization that promotes the development of a digital culture in Chile, articulating the construction of alliances and executing public-private projects, as well as generating content that contributes to the debate in the area of a digital economy and Chile's development facing the challenges of the Fourth Industrial Revolution.

