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4 de mayo de 2016 - CEPAL Santiago de Chile

Taller de trabajo sobre energía solar

- Diálogo entre los actores públicos y privados de la región
- Impulso al desarrollo de la industria en América Latina
- Creación de sinergias y redes de cooperación

Inscripciones al mail: gabriela.tormo@cepal.org



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cooperación
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Con el apoyo de:





Taller de trabajo: Energía Solar

9.30 – 11.15 PANEL 1. Centros tecnológicos en energía solar: principales centros de la región

Moderador: Rodrigo Palma, Director Solar Energy Research Center (SERC Chile)

Panelista 1: Dr. Manuel Martínez Fernández, Centro Investigación en Energía, UNAM, México

Panelista 2: Dr. Homero Schneider, CTI Renato Archer, Brasil

Panelista 3: Roberto Román, Director, International Solar Energy Society (ISES)

Panelista 4: Rodrigo Vásquez, Asesor Programa Energía, GIZ

Panelista 5: José Luis Checa, Fundación Leitat Chile

Panelista 6: Werner Platzer, Director Fraunhofer CSET

SERC CHILE

SOLAR ENERGY RESEARCH CENTER

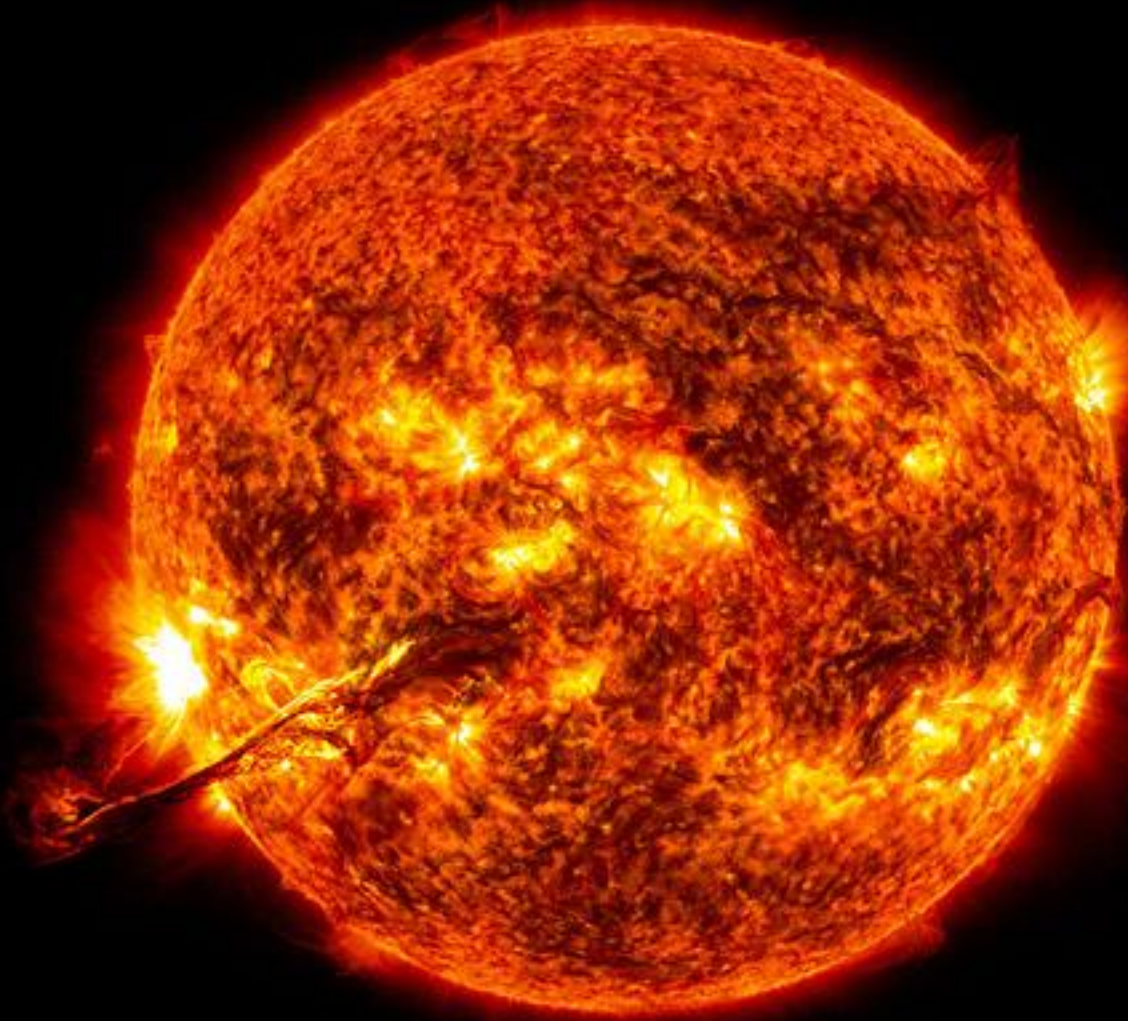


UA
Universidad
de Antofagasta



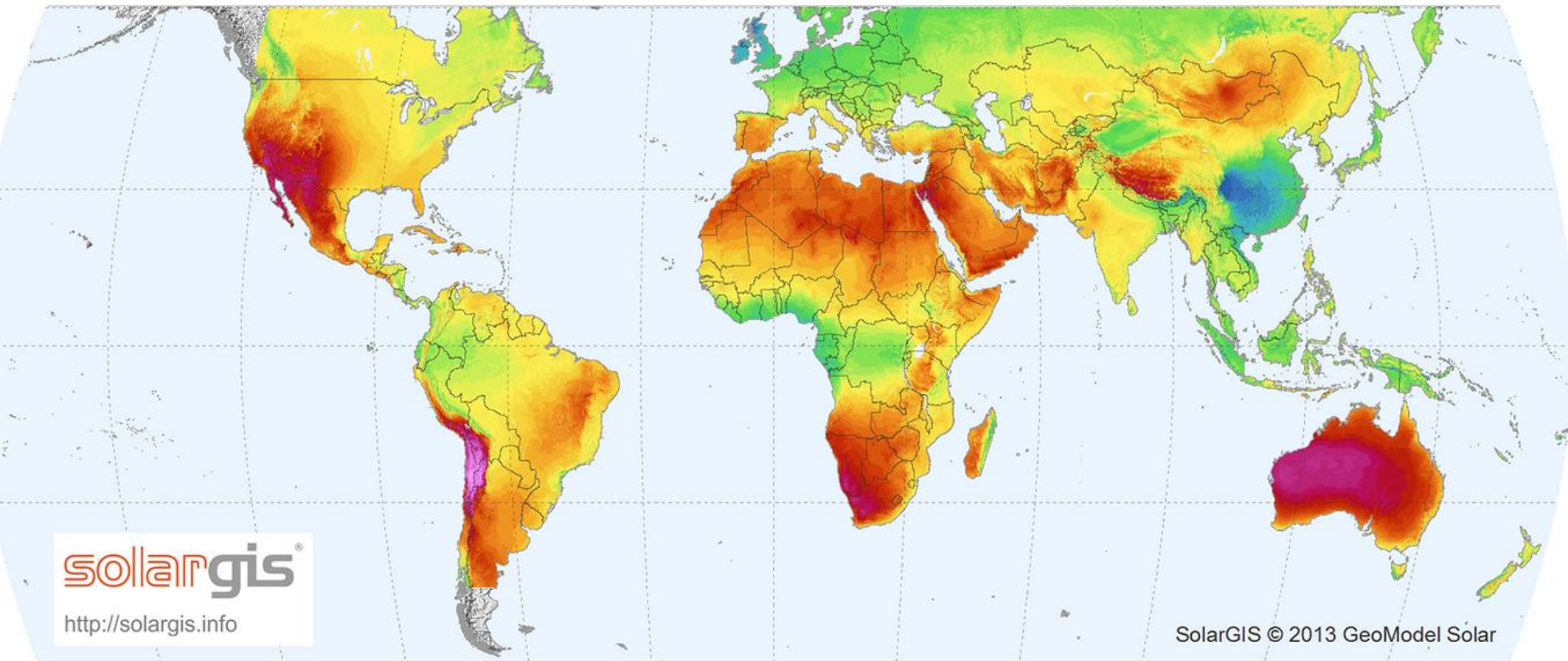
UNIVERSIDAD ADOLF O IBÁÑEZ

FCh
FUNDACIÓN CHILE




WORLD MAP OF DIRECT NORMAL IRRADIATION

GeoModel
SOLAR



Annual sum < 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 >

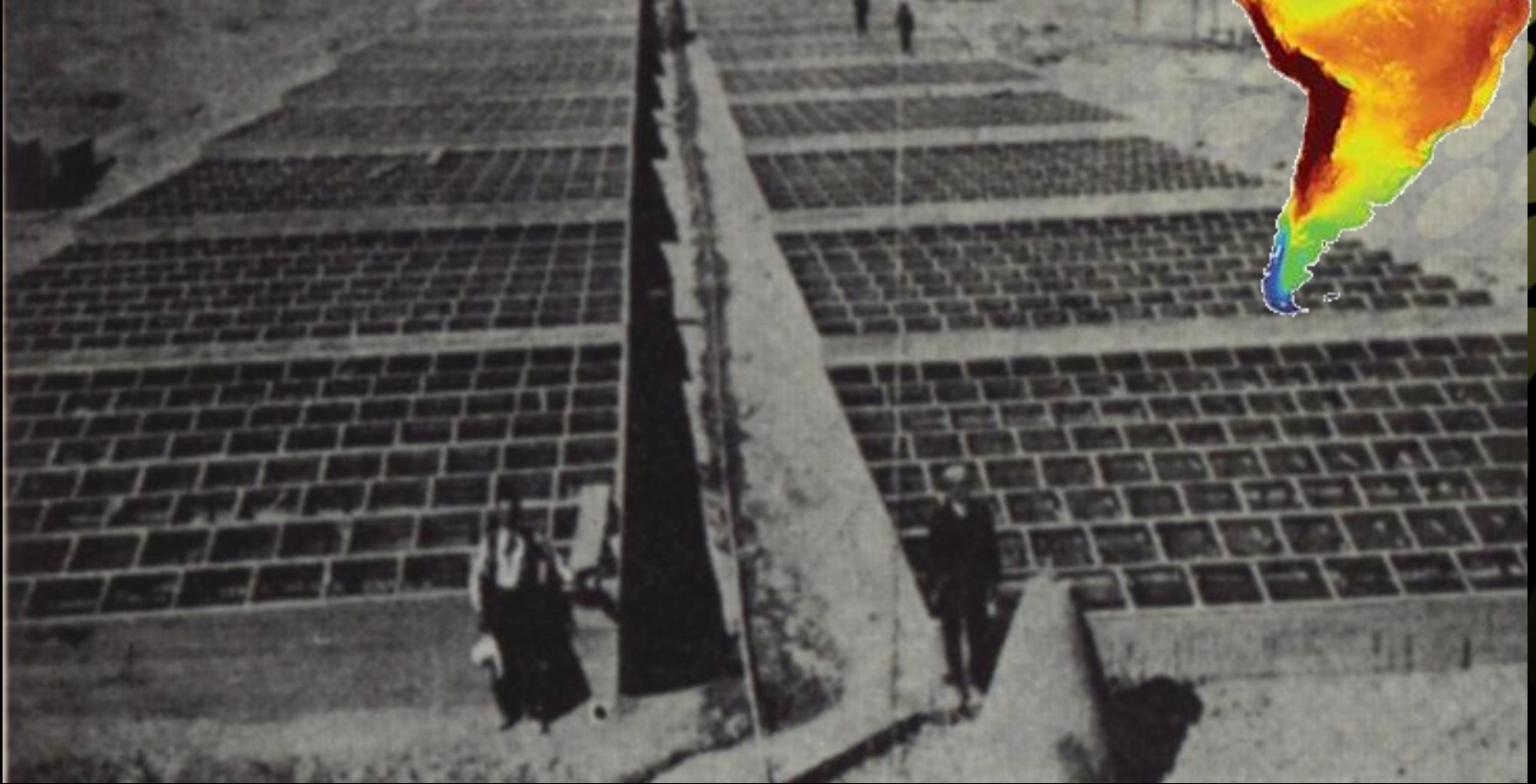
Long-term average of:  kWh/m²

Daily sum < 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 >





1872



Ref: J. Hirschmann
Charles Wilson, en 1872 se atrevió y construyó
un gran destilador solar en "Las Salinas", en las cercanías de la Salitrera Chacabuco.





FONDAP

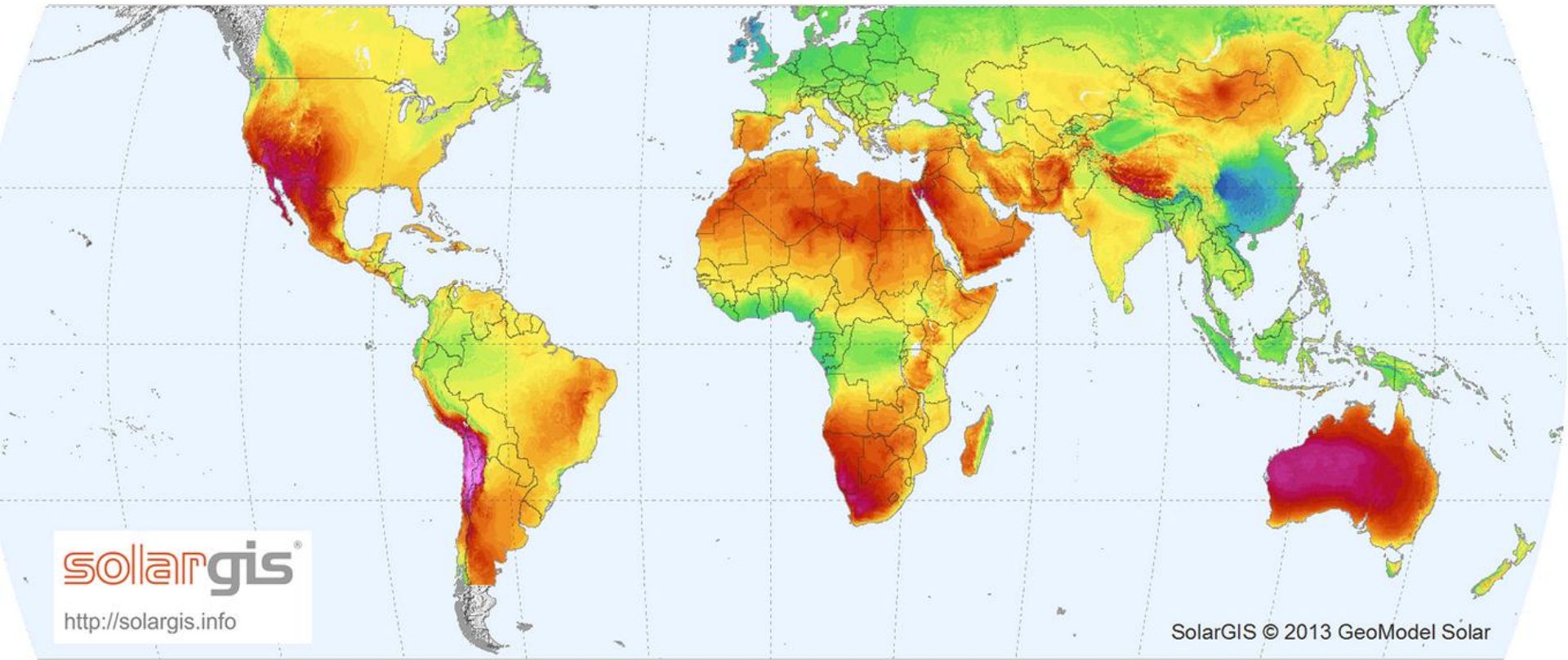
Centro de Excelencia CONICYT

SERC  **CHILE**
SOLAR ENERGY RESEARCH CENTER

Construir una base sólida de conocimiento en torno a la energía solar que **potencie las condiciones excepcionales de la zona norte de nuestro país** en este tema, a través de la investigación en los **desafíos científicos, técnicos y económicos**, y las **oportunidades** que ofrece la tecnología solar para la **matriz energética nacional**.



WORLD MAP OF DIRECT NORMAL IRRADIATION



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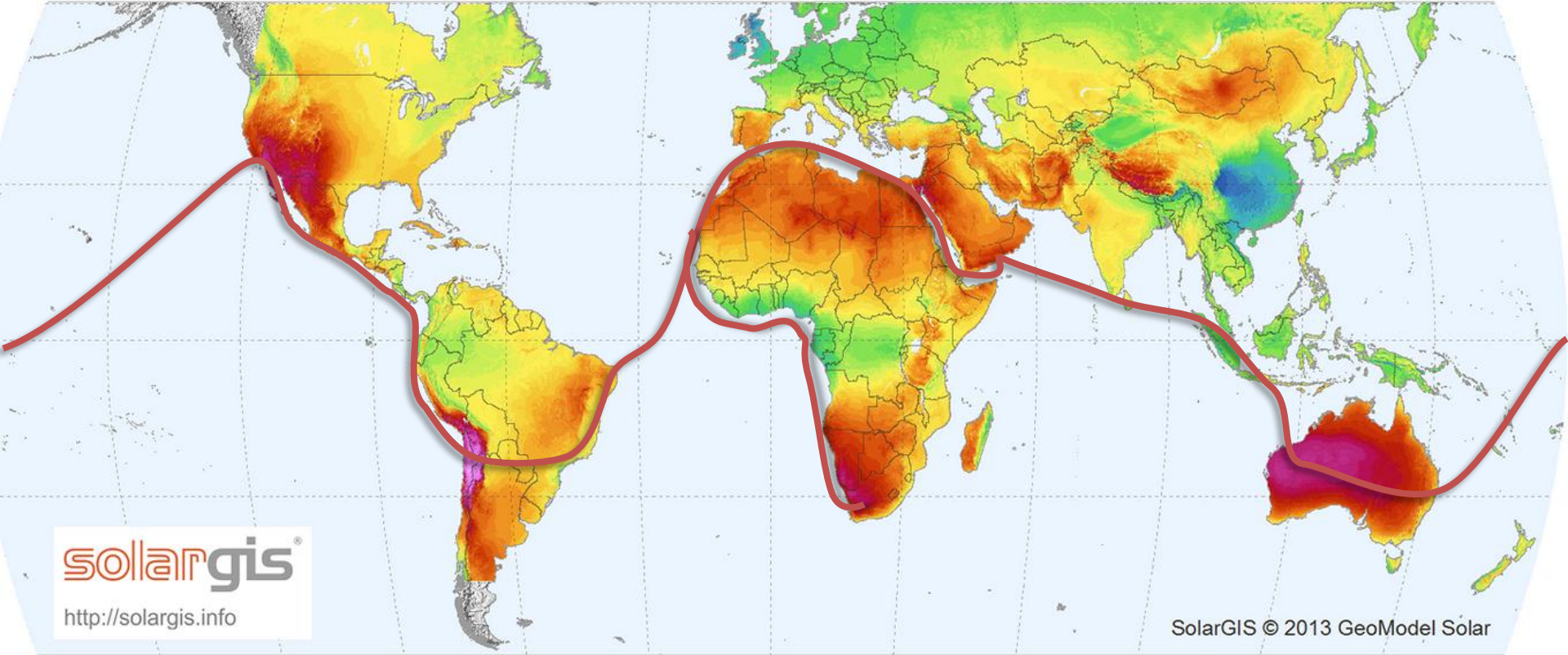
Optical fibre belt



World Solar Belt

WORLD MAP OF DIRECT NORMAL IRRADIATION

GeoModel
SOLAR



solarGIS
<http://solargis.info>

SolarGIS © 2013 GeoModel Solar

Annual sum < 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 >

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Desafío multidimensional del sol

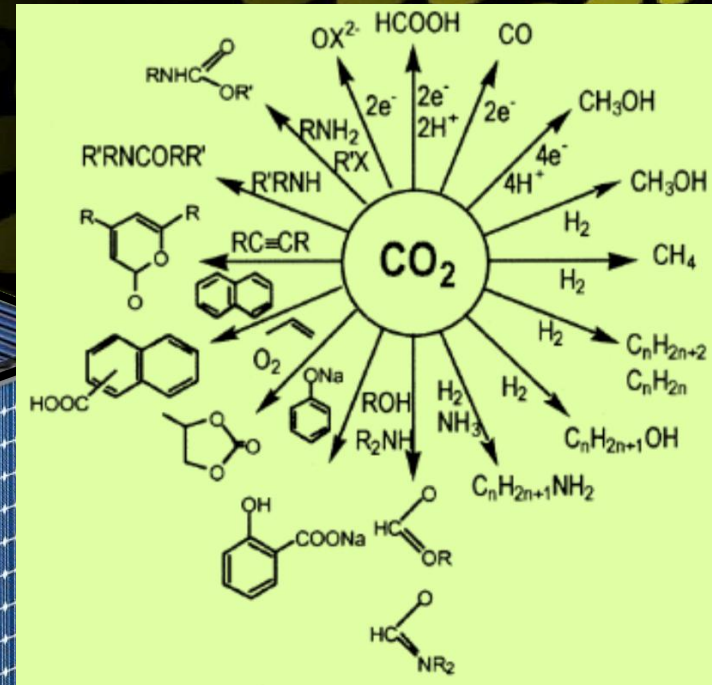
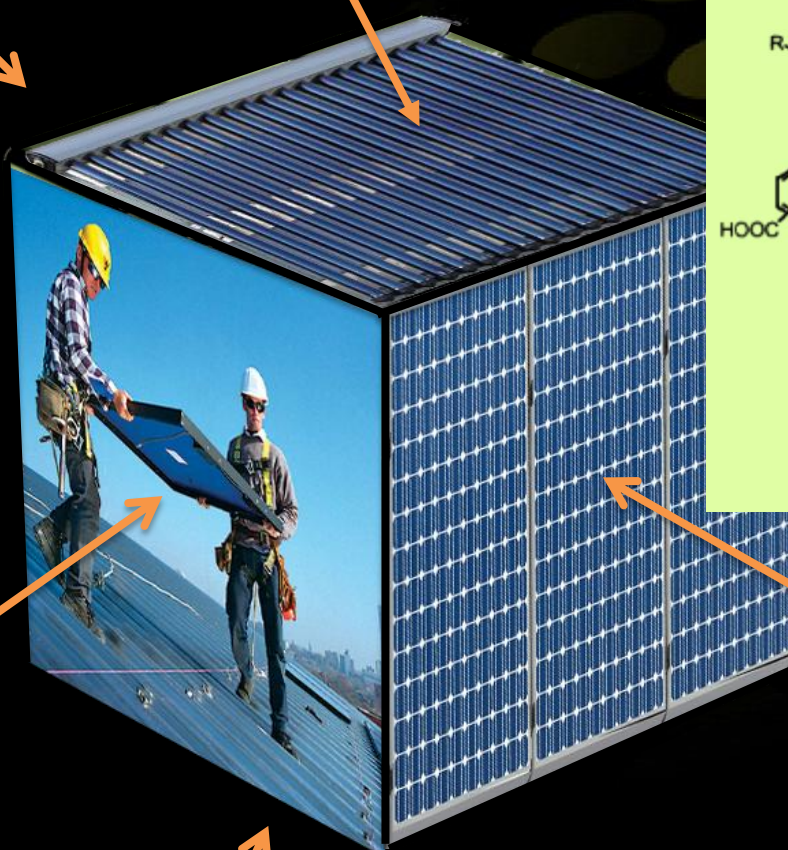
Desarrollo socio-ambiental

Producción de calor

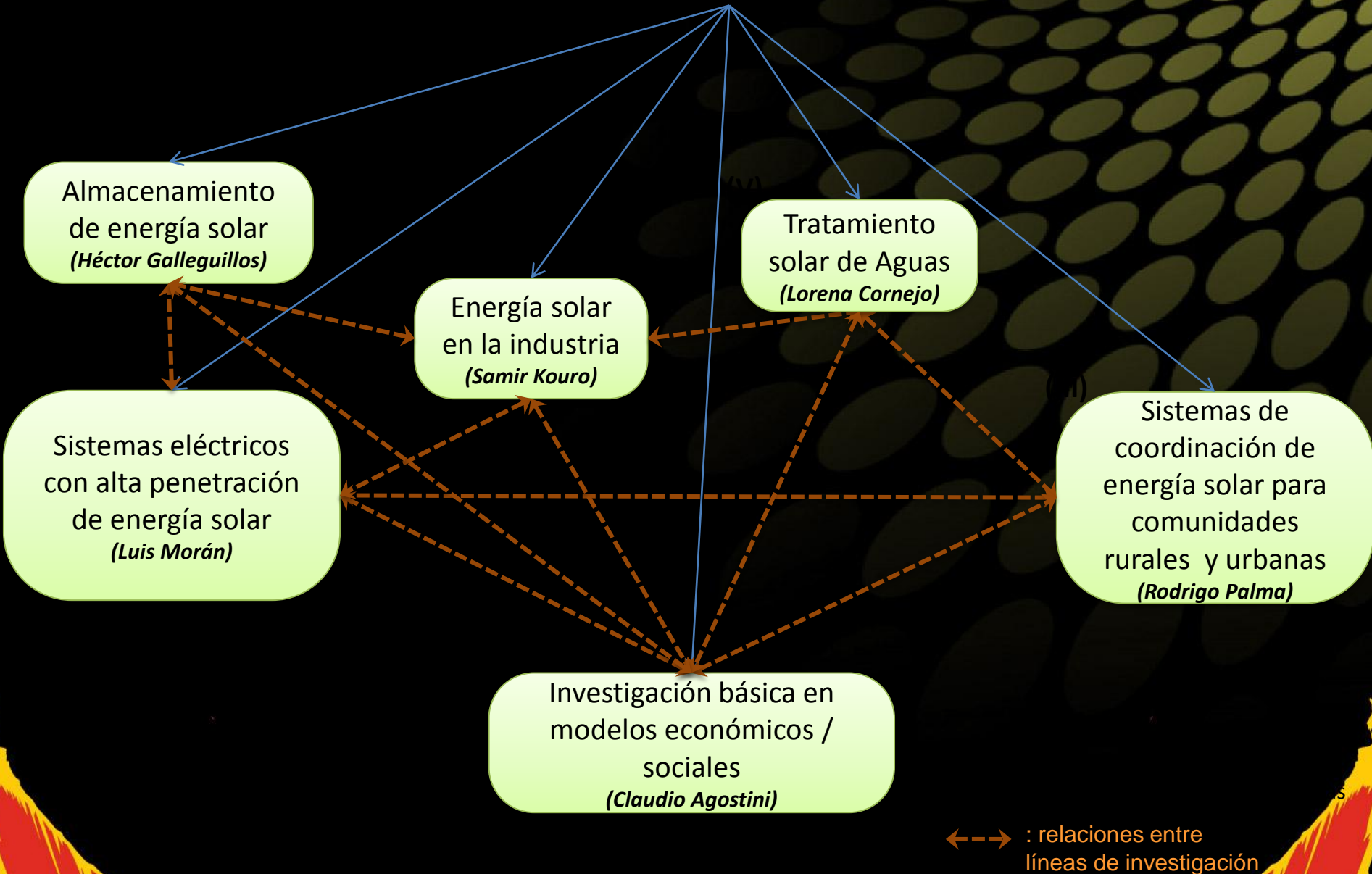
Desarrollo productivo, industria local

Tratamiento solar de agua

Producción de electricidad



Líneas de investigación deSERC



Publicaciones en los primeros 3 años

125 ISI Papers,

16 libros/capítulos, 200 conferencias

Impacts of Energy Storage on Short Term Market Planning Under Centralized Spot Markets

Carla Sotomayor, Member, IEEE, Fabian Poyato Benavente, Rodrigo Palma-Behnke, Senior Member, IEEE, and Xian-Ping Zhang, Senior Member, IEEE

Abstract—Energy storage (ES) is becoming an important asset in power systems. This paper studies the impact of ES on short-term market clearing under centralized spot markets. The impact of ES is analyzed in terms of market clearing prices (MCP) and the impact of ES on the market clearing process. The impact of ES on the market clearing process is analyzed in terms of the market clearing process. The impact of ES on the market clearing process is analyzed in terms of the market clearing process.

BY USING ES TO STORE ENERGY, power systems can reduce the need for fossil fuel generation, which is the most expensive and polluting source of energy. This paper studies the impact of ES on short-term market clearing under centralized spot markets. The impact of ES is analyzed in terms of market clearing prices (MCP) and the impact of ES on the market clearing process. The impact of ES on the market clearing process is analyzed in terms of the market clearing process.

Restless Water

By Hugh Rudnick, Rodrigo Palma-Behnke, Andrea Rudnick, and Carlos Benavides

Impact of a Carbon Tax on the Chilean Electricity Sector

Manuel Diaz^{1,2}, Rodrigo Fuentes^{3,4}, Gonzalo Garcia^{5,6}, and Catalina Rarizaza^{3,4}

¹Engineering Center, Faculty of Physical and Mathematical Sciences, Universidad de Chile, Santiago 8370451, Chile; E-Mail: mdiaz@dm.uchile.cl (M.D.); ²Center for Economic and Social Policy, Pontificia Catholic University of Chile, Santiago 7820436, Chile; E-Mail: rgonzalez@c.vep.usach.cl; ³Center for Economic and Social Policy, Pontificia Catholic University of Chile, Santiago 7820436, Chile; E-Mail: gfgarcia@uc.cl (G.G.); ⁴Catalina Rarizaza@uc.cl (C.R.); ⁵Center for Economic and Social Policy, Pontificia Catholic University of Chile, Santiago 7820436, Chile; E-Mail: catalina.rarizaza@uc.cl (C.R.); ⁶Center for Economic and Social Policy, Pontificia Catholic University of Chile, Santiago 7820436, Chile; E-Mail: catalina.rarizaza@uc.cl (C.R.)

Abstract—The increasing interest in integrating intermittent renewable energy sources into microgrid operation has led to the development of reliable operation strategies. In this paper, the major issues and challenges in microgrid operation are discussed, and a review of state-of-the-art control strategies is presented. A general overview of microgrid control systems is also included. The paper is organized as follows: first, the operation of microgrid control systems is presented. Then, the operation of microgrid control systems is presented. Then, the operation of microgrid control systems is presented.

It Takes a Village

By Guillermo A. Jiménez-Estévez, Rodrigo Palma-Behnke, Diego Ortiz-Villalba, Oscar Núñez Mata, and Carlos Silva Montes

THE WORLD BANK, ONE OF THE MOST IMPORTANT supporters of rural electrification projects, estimates that approximately 1.2 billion people do not have regular access to electricity in Latin America as a whole, according to the International Energy Agency, the electrification rate has reached 92.7% but that still leaves 33.8 million people without access to electricity (see Figure 1). They live mostly in rural and isolated areas that are often neglected by electrification projects due to the high associated costs and technical difficulties.

Trends in Microgrid Control

Chairman: Claudio A. Calzavara
Contributors: Daniel E. Olivares, Student Member, IEEE, Amir H. Etemad, Student Member, IEEE, Claudio A. Calzavara, Fellow Member, IEEE, Majken Sandgaard, Senior Member, IEEE, and Guillermo A. Jiménez-Estévez, Senior Member, IEEE, NS

High-Power Wind Energy Conversion Systems: State-of-the-Art and Emerging Technologies

Wind energy installed capacity increased exponentially over the past three decades, and has become a real alternative to increase renewable energy penetration into the energy mix.

By VENKATA YAKAMANI, Member, IEEE, Bin Wu, Fellow, IEEE, PARESH C. SEN, Life Fellow, IEEE, SAMIR KOUBRO, Member, IEEE, and MEHDI NARIMANI, Member, IEEE

ABSTRACT | This paper presents a comprehensive study on the state-of-the-art and emerging wind energy technologies from the electrical engineering perspective. In an attempt to do the electrical engineering perspective, increase the wind energy conversion efficiency, power density, and comply with the increasing create costs, the most significant generator and power electronic converters have emerged in a rigorous manner. From the market based survey, the most advanced generator-topology configurations are addressed along with the promising topologies available in the literature. The high-power wind energy conversion systems (HWECs) are investigated for high-power wind energy conversion systems (HWECs), and represented in the low and medium-voltage systems (LWECs), and represented in the low and medium-voltage systems (LWECs), and represented in the low and medium-voltage systems (LWECs).

Heat and Dust

The Solar Energy Challenge in Chile

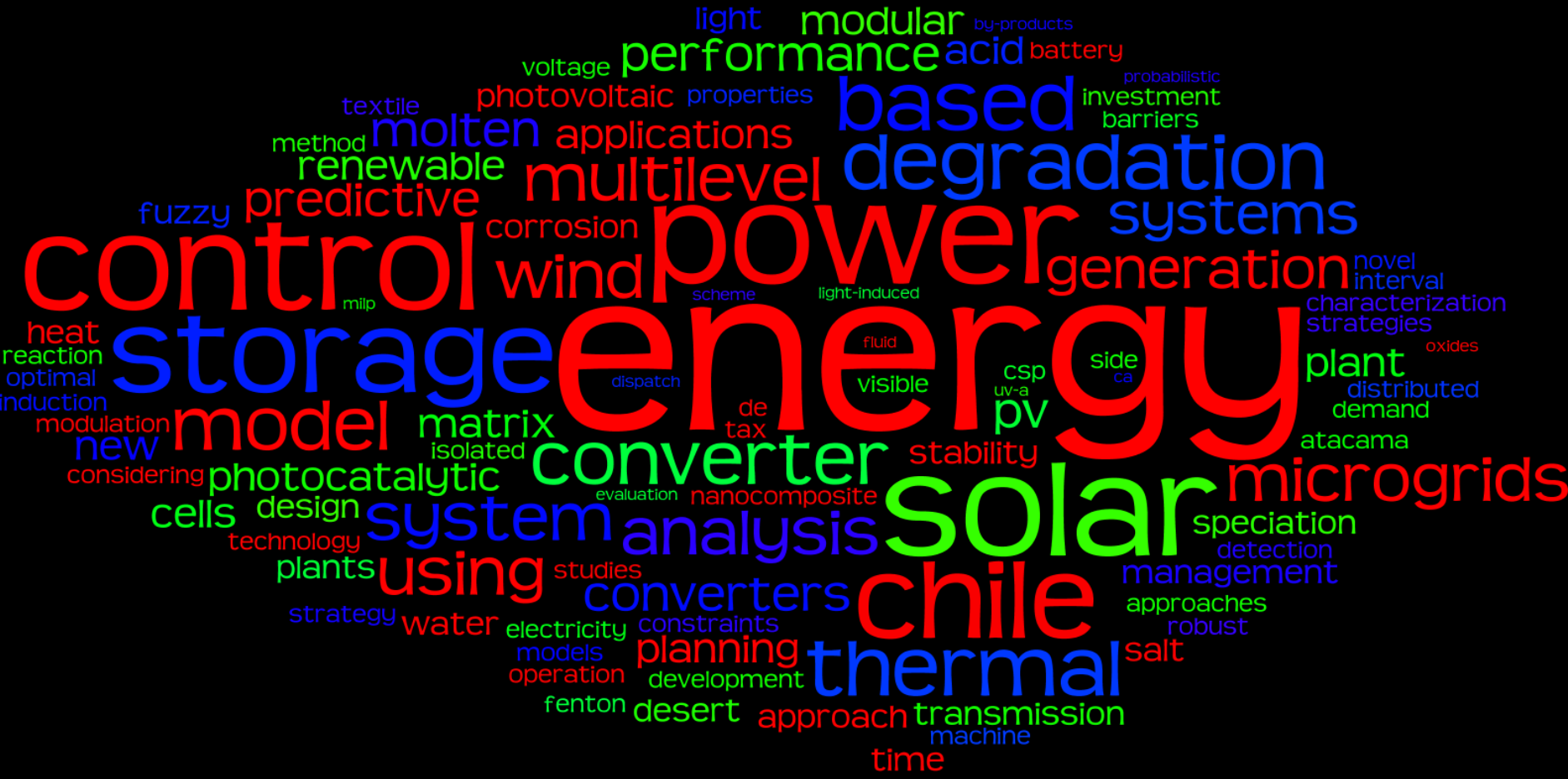
By Guillermo A. Jiménez-Estévez, Rodrigo Palma-Behnke, and Oscar Núñez Mata

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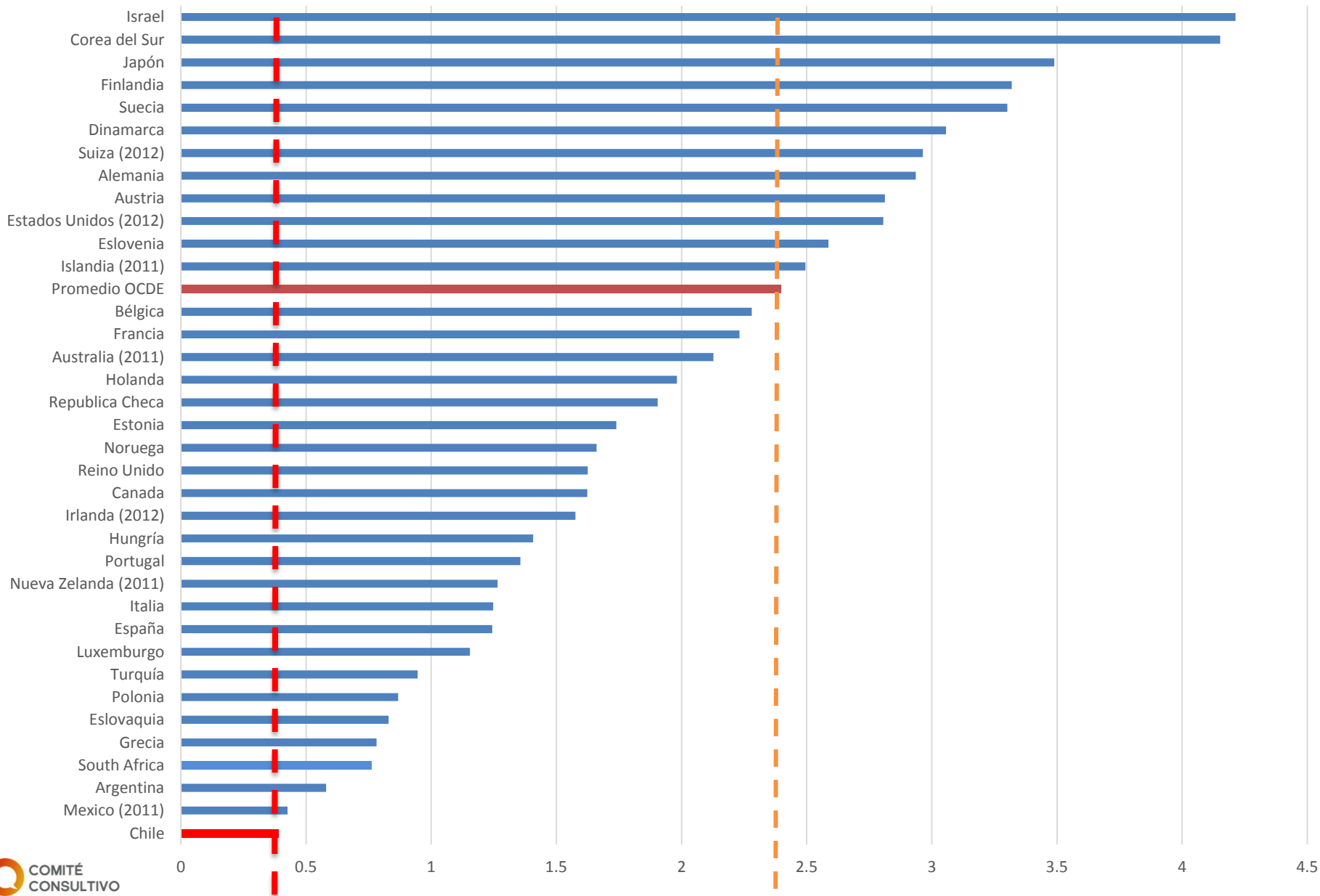
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Gasto en I&D en Chile

Expenditure in R&D expressed as % of GDP

Source: CORFO, <http://www.oecd.org/innovation/inno/researchanddevelopmentstatisticsrds.htm>



I&D



Otras
Ues, Centros

Ejemplo Asociaciones



CIFES
Ministerio de Energía

Estrategia solar de Chile

ABENGOA

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Ejemplo Empresas



Sociedad