



INTEGRATED SOLAR PV FACTORY

Energía Provincial Sociedad del Estado (EPSE), San Juan, Argentina



SCHMID – Facts & Figures

5
Production facilities worldwide
with over 71,000 sqm area.

450
More than 450 patents, products
and process solutions since 1864.

1,200
Over 1,200 employees worldwide.

3
3 Technology Centers
in our key markets.

17
Sales and service
in 17 countries.

We are SCHMID

SAP ERP fully integrated.

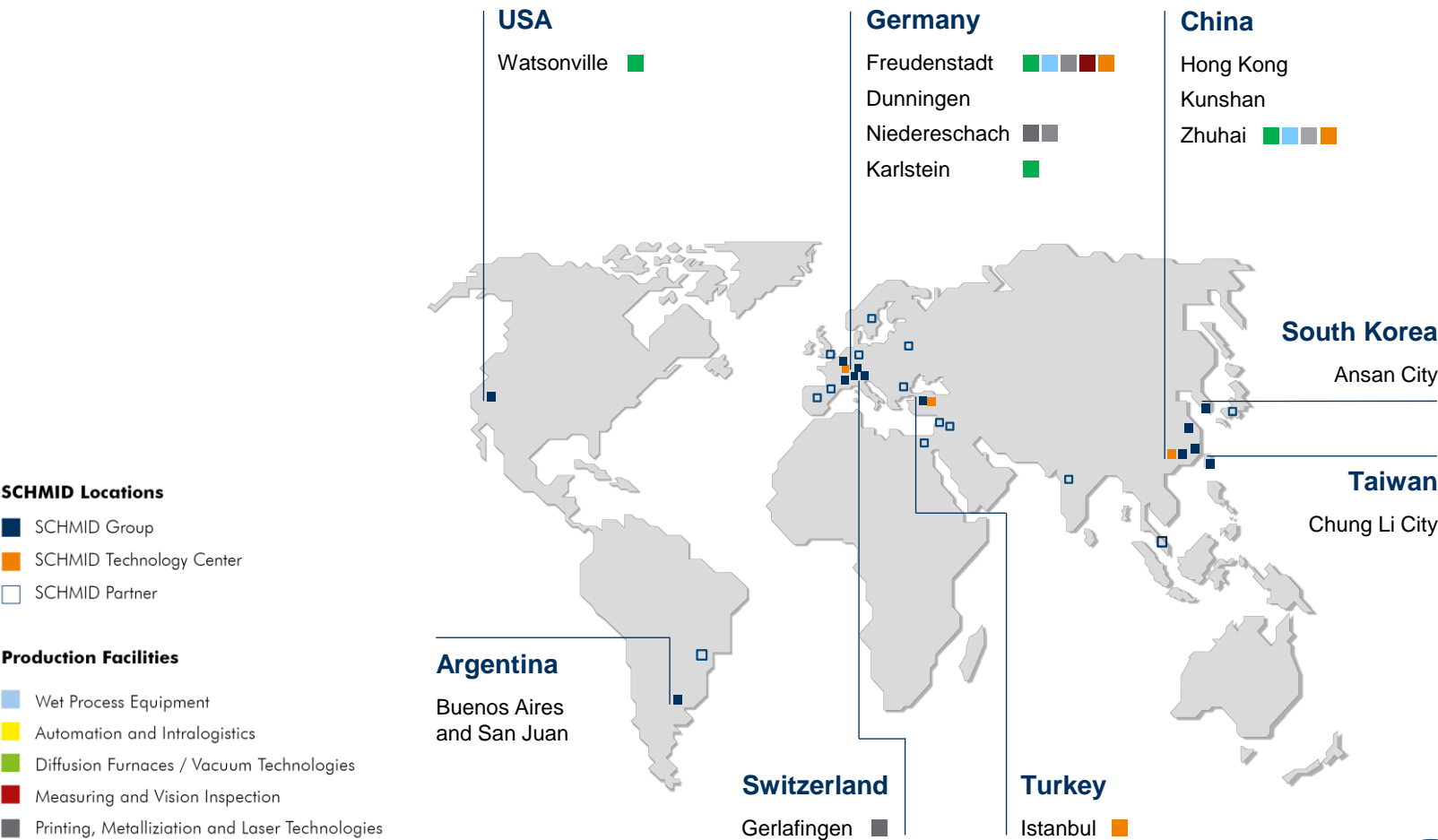
150
Founded 1864
More than 150 years experience.

SCHMID Academy
For **high quality** internal training.

5
Owner-operated family business in 5th generation.

1995
DIN EN ISO 9001 certified since 1995.

SCHMID Global Network



Business Units SCHMID Group



Electronics

Printed Circuit Boards
Substrates
Photochemical Milling
Surface Finishing



Photovoltaics

Silicon
Wafer
Cell
Module
Thin Film and Glass
Integrated Fab Solutions



Automation

montrac® Intralogistics
Robotics
Transport Components
Control Systems

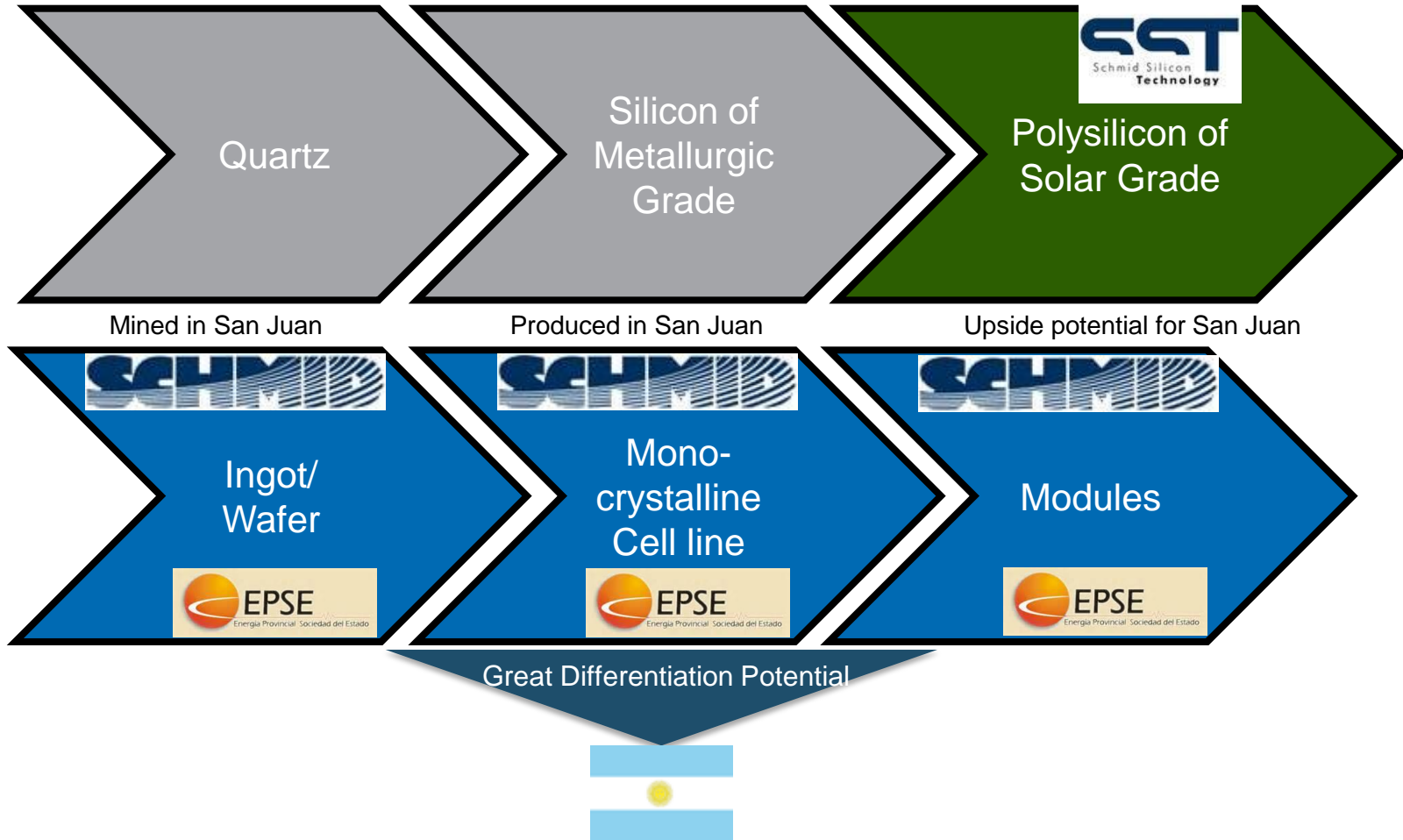


Energy Systems

Vanadium Redox Flow
Battery (VRFB)

Four business units function as a large system taking advantage of synergy effects. Existing technology and process expertise can thus be adapted quickly to new industrial requirements.

Solar PV Value Chain – Motivation of EPSE San Juan Project



The complete value chain can be Argentinean – from the Mineral to the Module

Presentation of SCHMID's customer, EPSE

COMPANY

- EPSE is a company owned by the Province of San Juan
- 100% state-owned, responsible for energy projects of multiple sources
 - Solar PV, Hydroelectricity on San Juan River, Wind parks, Bioenergy



PROJECT

First Integrated Solar PV project for Ingot – Wafer – Cell – Module production
71 MWp annual mono crystalline production capacity
First module shipments expected by Q4 2017

SCHMID's scope of deliverables for EPSE

SCHMID

- Technology provider
- Supplier of all manufacturing equipment for Ingot/Wafer, Cell and Module
- General contractor for an integrated factory including
 - Engineering
 - Logistics
 - Planning
 - Civil construction
 - Infrastructure and building utilities
 - Process utilities
 - Installation
 - Commissioning

Schmid established the Schmid Branch Argentina in San Juan for Project Supervision

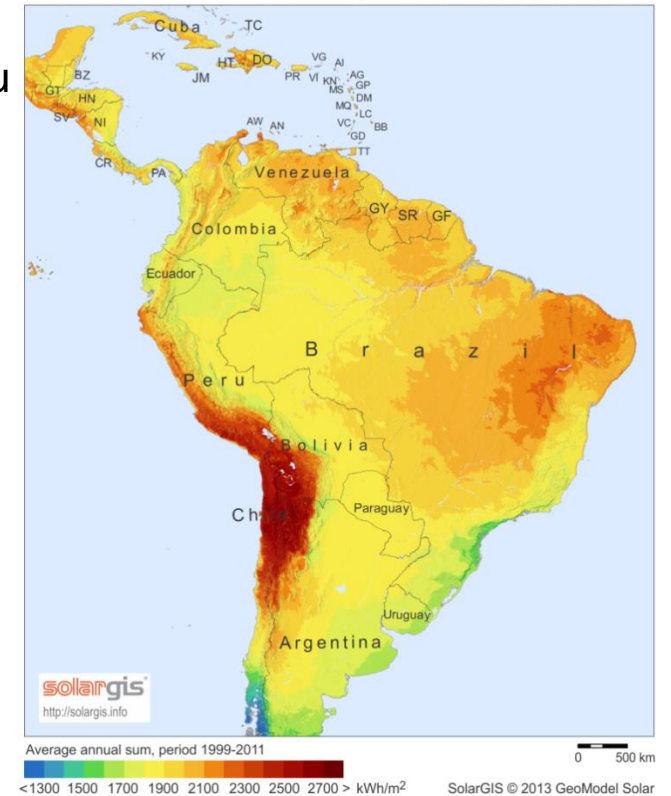
Solar conditions in San Juan Province

- Highest solar radiation in the world
- Condition shared between Argentina, Bolivia, Chile, Peru
- Energy capacity factors of up to 35% possible
- In the 2016 renewable auction, 213 MW of solar PV was awarded to San Juan province

RONDA 1.5- PROYECTOS ADJUDICADOS: SOLAR

TECNOLOGÍA	REGIÓN	ID	PROVINCIA	NOMBRE DEL PROYECTO	OFERENTE	MW	PRECIO ADJUDICADO (USD/MWh)
 SOLAR	RESTO SOLAR	SPV-31	SAN JUAN	P.S. Sarmiento	SOENERGY INTERNATIONAL INC.	35	53,0
		SPV-46	SAN JUAN	P.S. Ullum N1	FIDES GROUP S.A.	25	53,7
		SPV-49	SAN JUAN	P.S. Iglesia - Guañizuli	JINKOSOLAR HOLDING CO.LTD.	80	54,1
		SPV-45	SAN JUAN	P.S. Ullum N2	ALEJANDRO IVANISSEVICH	25	55,2
		SPV-37	SAN JUAN	P.S. Ullum 4	COLWAY 08 INDUSTRIAL	14	56,5
		SPV-32	SAN JUAN	P.S. Ullum3	ALEJANDRO IVANISSEVICH	32	57,6
		SPV-57	SAN JUAN	P.S. Las Lomitas	LATINOAMERICANA ENERGIA	2	59,2
		SPV-41	SAN LUIS	P.S. La Cumbre	DIASER S.A.	22	56,7
		SPV-36	SAN LUIS	P.S. Caldenes del Oeste	QUAAATRO PARTICIPACOES S.A.	25	58,9

Global Horizontal Irradiation Latin America and the Caribbean

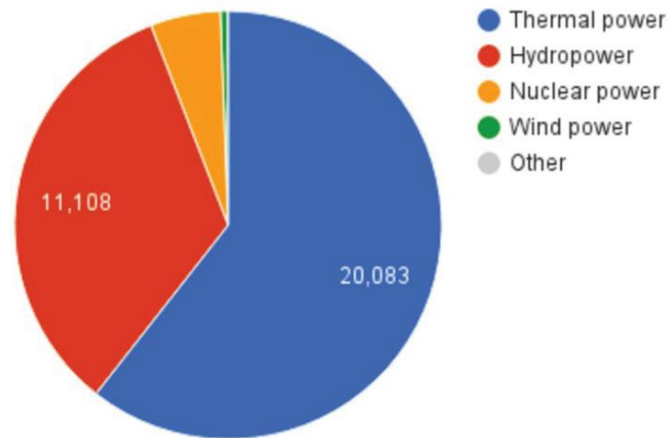


Awarded solar PV capacity will contribute 43% of San Juan peak demand (480 MW currently)

Solar PV roll-out in Argentina

- 2,3 GWp of renewable energy capacity awarded in 2 auctions in 2016
- Supporting government program RenovAir based on law 27.191 which requires 8% renewable generation end 2017 and 20% by 2025 (~10 GW)
- 33 GW generation capacity 2016 split:

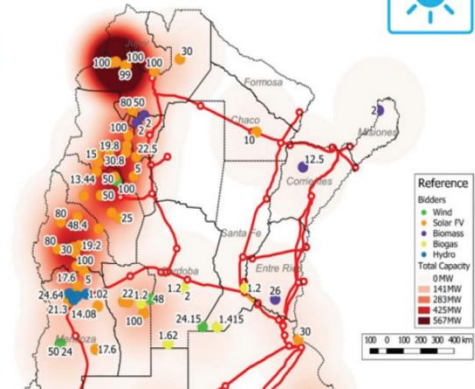
Argentina's Total Energy Capacity by Energy Sources (in MW)



- Solar PV bids received totaled 2.811 MW, on 58 projects

Bids Received - Round 1

PROVINCE	# PROJECTS	CAPACITY (MW)	NET P50 CAPACITY FACTOR (%)	AVERAGE LOCAL CONTENT (%)
SALTA	9	829	34%	8%
SAN JUAN	14	558	29%	13%
JUJUY	4	400	25%	17%
LA RIOJA	7	318	29%	8%
CATAMARCA	9	315	30%	12%
SAN LUIS	4	197	27%	18%
MENDOZA	8	124	27%	67%
BUENOS AIRES	1	30	19%	68%
CORDOBA	1	30	24%	0%
CHACO	1	10	25%	40%
TOTAL	58	2811	29%	21%



- 400MW awarded 1st round
- 516MW awarded 2nd round
- Average solar price was US\$ 54,94
- PERMER – rural electrification program awarded 5700 projects (out of 7500 planned in 2016)

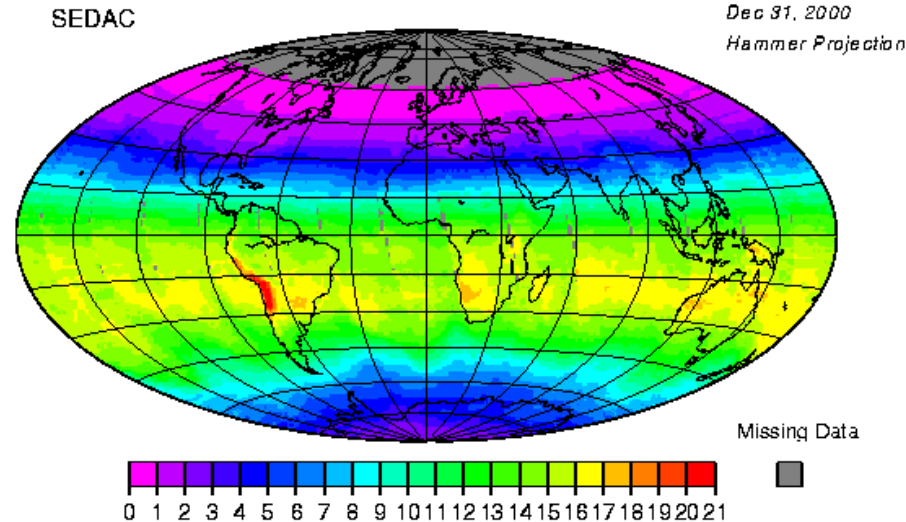
Renewable Energy in Argentina – Projections



Source: Solarplaza

Argentina as PV Gate Way to South America

e.g. Chile 'Atacama' Region – Highest solar irradiation and UV factor



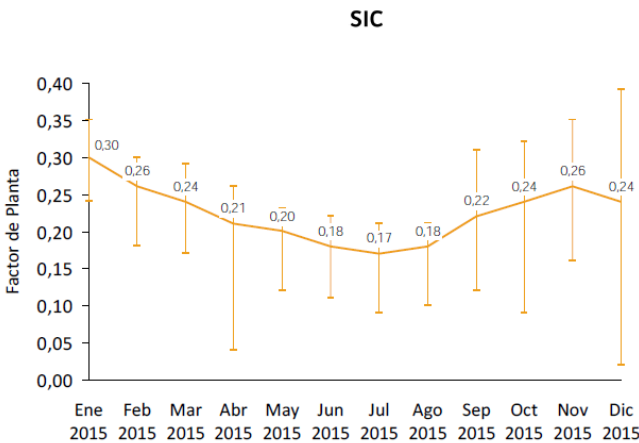
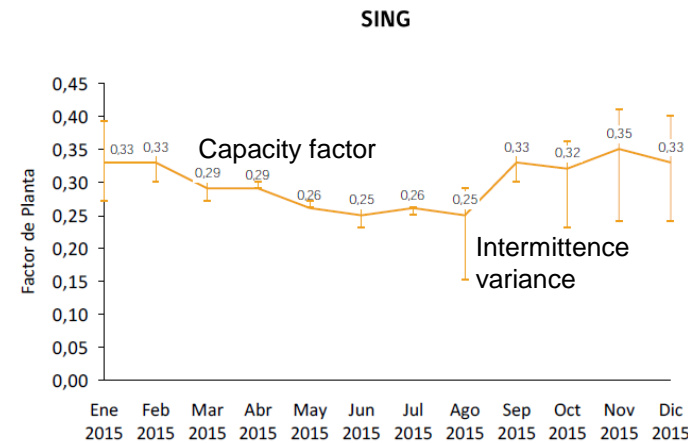
Solar UV irradiation in Atacama was measured with a factor up to 42

Daily UV irradiance 4 to 6 times higher than in Europe or USA

Requires special attention on process technology and materials employed

Chile Solar PV Benchmark – High capacity factor

Factor de Planta de Centrales Solares PV



Fuente: CDEC-SIC / CDEC-SING. CIFES, Enero 2016.

Monthly solar PV capacity factors from 25% to 35% in SING (Northern Atacama)

No intermittence from clouds from January to July in northern Chile!

Similar conditions in Argentina's northern Highlands

Conclusions over the Solar PV Potential in Argentina

- The magnificent insolation of Argentina permits that > 10% of national electricity consumption could be sourced from Solar PV by 2025
 - This represents a grand economic development opportunity for the provinces in the arid and semi-arid regions of the Argentinean highlands
- The complementarity of Solar, Wind and Hydro Electricity allows to aim for a very high regional value aggregation with premium capacity factors
-which will permit very high returns on Generation, Substation and Transmission infrastructure investments in the Highlands of Argentina
 - Provinces which may be most benefited include Mendoza, San Juan, San Luis, Tucuman, Salta, Catamarca and Jujuy
- Roll out as a gate way to other countries with high potential demand for PV installations like Chile.



THANK YOU FOR YOUR ATTENTION!

Please feel free to contact us if you have any questions:

Thomas Eggers | Representative Latin America | Solar PV

Phone +49 7441 538-0 | Mobile +55 21 9 9289 8000

eggers.th@schmid-group.com

DISCLAIMER

The information contained in this presentation is for background purposes only and is subject to amendment, revision and updating. This presentation may imply forward-looking statements that are based on management's current views and involve risks, assumptions and uncertainties which could cause actual results, performances or events or other circumstances to differ materially from those expressed or implied by the forward-looking statements. Forward-looking statements can be identified by reason of context, including without limitation, statements referring to risk limitations, operational profitability, financial strength, performance targets, profitable growth opportunities and risk adequate pricing, as well as the words "may, will, should, expects, plans, intends, anticipates, believes, estimates, predicts, or continue", "potential, future, or further", and similar expressions. Statements contained in this presentation regarding past trends or activities or other circumstances should not be taken as a representation that such trends or activities or other circumstances will continue in the future. SCHMID is not obligated to update or revise any statements contained in this presentation. In particular, you should not place undue reliance on forward-looking statements, which speak only as of the date of this presentation.

This information is being provided to you without any warranty or guarantee, express or implied, statutory or otherwise. Furthermore, SCHMID and/or any of its respective affiliated companies, officers, employees, advisors or agents shall not be liable or responsible in any other way or form for this presentation and its contents. By use and your acceptance of this information, you hereby agree to this disclaimer.

Nothing in this presentation is intended to create or amend any legally binding relationship between SCHMID and the recipient hereof. Any legally binding relationship or any amendment of a legally binding relationship between SCHMID and the recipient hereof in connection with the content of this presentation must be in writing and hand signed by both parties.

All information contained in this presentation shall remain the property of SCHMID or its respective affiliated companies.