



JOIN THE CENTURY OF SOLAR

A Year of Virtual Celebration

SWC50-The Century of Solar Celebration Newsletter – May 2021

This month we provide

- A brief overview of solar research and applications in the 1970's; and
- A focus on Southern Africa.

The overview of solar in the 1960's provides some key highlights taken from the booklet:

[ISES SWC50 The Century of Solar Stories and Vision Booklet](#)

For more highlights, please refer to the booklet or the [ISES Solar Energy Museum – Past, Present and Future](#)

ISES 1970's

Significant events in the history of ISES in the 1970's include:

- In 1970 the ISES headquarters moved from the USA to Australia leading to the American Solar Energy Society – [ASES](#) - forming.
- The first international ISES Solar World Congress was held in March 1970.
- In 1971 the Society changed its name to the **International Solar Energy Society (ISES)**.
- Numerous country sections were formed during the 1970's.
- In 1975, the first ISES award, the [Farrington Daniels Award](#), was awarded to Professor Hoyt Hottel.

SES Presidents in the 1970's

Years	President	Country
1970	R.N. Morse	Australia

ISES Presidents in the 1970's

Years	President	Country
1971-1973	J. A. Duffie	USA
1973-1975	G. O. G. Löf	USA
1975-1976	W. H. Klein	USA
1977-1979	R. L. Datta	India
1979-1980	W.W.S. Charters	Australia

What is SWC50 – The Century of Solar?

In 1970 solar research pioneers met at the first International Solar Energy Society (ISES) Conference in Melbourne Australia. ISES commemorated in 2020 this first Solar World Conference with a special 50th Anniversary Virtual Conference, called the Solar World Congress at 50 (SWC50).

During these past 50 years solar energy has grown from being emerging technologies to a vibrant industry. The Century of Solar highlights the transformation in the global energy sector that has taken place since the first Solar World Congress in 1970 and looks forward to the next 50 years when solar energy will be a major cornerstone of the global energy system. While the focus of the Century of Solar is on the evolution of solar energy, the importance of other renewable energy sources working together to reach the 100% renewable energy world goal will be a central theme.

SWC50 - The Century of Solar is about the people: researchers, industry players, policy makers, and leaders of NGOs and Non-profit organizations who have all contributed to make solar energy the fastest growing contributor to new electricity capacity.

SWC50 Programme: The SWC50 virtual conference was held on 3 - 4 December 2020, with two follow up webinars due in 2021.

August 2021 Webinar

Transforming the Transport Sector: Sector Coupling, and the Future Roles of Biofuels and Hydrogen/Fuel Cell Technologies

Conferences and Meetings 1970

Year	Location	Overview
1970	Melbourne Australia	1970 first international ISES Solar World Congress; Approx. 190 attended; 62 papers
1971	Greenbelt USA	Goddard Space Flight Centre 180 attended, 40 papers
1973	Paris France	ISES Solar World Congress 1973: <i>The Sun in the Service of Mankind</i> Approx. 600 registrants, 300 papers, 60 countries represented
1975	Los Angeles USA	ISES Solar World Congress 1975: <i>Solar Use Now; a Resource for People</i> Nearly 2,000 registrants, 280 papers Farrington Daniels Award: Professor Hoyt C. Hottel (USA)
1977 but held January 1978	New Delhi India	ISES Solar World Congress 1978: <i>Mankind's Future Source of Energy</i> 1,100 registrants, 342 papers Farrington Daniels Award: Professor Valentine A. Baum (Russia)
1979	Atlanta USA	ISES Solar World Congress 1979: <i>Silver Jubilee Congress</i> 2,000 registrants, 430 papers Farrington Daniels Award: Professor Félix Trombe (France)

Photovoltaics' 1970's

Though total production is small, many companies started manufacturing PV cells and modules predominantly driven by the oil crises of 1973. Solar cells began to power navigation warning lights and horns on many offshore gas and oil rigs, lighthouses, railroad crossings and telecommunication systems. The household solar applications are viewed as sensible applications in remote locations where connection to the utility owned power grid was not economical.

Significant events in the history of PV in the 1970's include:

- In 1972 the **Institute of Energy Conversion** was established at the University of Delaware to perform research and development on thin-film photovoltaic (PV) and solar thermal systems, becoming the world's first laboratory dedicated to PV research and development. First director is Professor Karl Böer and he steps down as director in 1975 to work full time at **SES Incorporated** which he founded in 1973. After a 12 months search, Dr Allen Barnett is appointed the next full time director of IEC .
- In 1974 The establishment of the **Solar Energy Research Institute (SERI)** was approved by the US Government though it would not open officially until 1977. This is the forerunner for the **National Renewable Energy Laboratory (NREL)**.
- Professor Martin Green joined the **University of New South Wales (UNSW)** (Australia) and started research on solar cells and the research group years later became what is now known as the **UNSW School of Photovoltaic and Renewable Energy Engineering (UNSW-SPREE)**.
- **Telecom Australia** constructed their first large scale solar powered telecommunications system with thirteen (13) solar powered repeaters 40kms apart from Tennant Creek to Alice Springs in the Northern Territory. From this success Telecom went on to build seventy similar projects with the longest being 2420 kilometres using forty-three (43) repeaters spaced 57kms apart.

Solar Thermal 1970's

In 1977 the International Energy Agency Solar Heating and Cooling Technology Collaboration Programme (IEA SHC) started and one key activity has been the presentation of the market data in the annual publication Solar Heat Worldwide. Solar Heat Worldwide was first published in the early 2000's, however, some countries were collecting data on the annual installed solar water panel installation capacity recorded in square metres (m²) since the 1970s.

Other significant events in the history of Solar Thermal in the 1970's include:

- Bill Charters and colleagues at the University of Melbourne developed the solar boosted heat pump. The evaporator is an unglazed solar collector.
- In 1974 Duffie and Beckman published "Solar Energy Thermal Processes" a first edition of a series of books to cover the engineering of solar thermal process.
- In 1974 George Löff oversaw the construction of a research house at Colorado State University that was the world's first to also be cooled by solar energy.
- In 1979 US President Jimmy Carter installs solar water heating on the Whitehouse.

CSP 1970's

Significant developments included were in 1977:

- The International Energy Agency (IEA) launched the Small Solar Power System projects – two 500 kW CSP projects – in Almeria, Spain, under an Implementing Agreement signed by 9 countries and lead by the US, Germany and Spain.
- The 1 MW CESA 1 project was initiated at the Plataforma Solar de Almería (PSA) in Spain, the site of the two IEA projects.
- CSP development in the US began with the opening of the US Department of Energy (DOE) and the creation of renewable energy incentives.

Solar Architecture/Buildings 1970's

Significant developments included:

- In 1973 the University of Delaware, under the direction of Karl Böer and Maria Telkes, builds "Solar One," one of the world's first photovoltaic (PV) powered residences. The system is a PV/thermal hybrid. The roof-integrated arrays fed surplus power through a special meter to the utility during the day and purchased power from the utility at night. In addition to electricity, the arrays acted as flat-plate thermal collectors, with fans blowing the warm air from over the array to phase-change heat-storage bins. It is also the first instance of building integrated photovoltaics (BIPV).
- In 1979 Dr Doug Balcomb builds "Unit One" in Santa Fe, New Mexico. 80% of its heating and cooling comes from Solar. It is known as "Unit One" because it is the first dwelling in a planned environmental community called First Village.
- Steven Strong completed several passive solar buildings with integrated PV systems. This has become mainstream in the 21st century in particularly but not exclusively in the developed world.

PV in Developing Countries 1970's

Using solar to provide power, particularly lighting, for the billions of people without access to electricity was one of the first markets identified when the solar manufacturers started in the 1970s. One other key application was water pumping for the villages. The 1970s saw these markets being explored. International bodies like UNDP, the EU Commission and others identify solar as a potential power source for unelectrified regions, in particular with d.c. solar home systems (SHS) that provided lighting and some services such as radio and sometimes television.

Other significant developments included:

- In the early 70's Patrick Jourde from the French Atomic Energy Commission based in French Polynesia is given the task to provide electricity to the outer atolls and islands. **G.I.E. Solar** was established to assemble the components to provide solar power to a house including development of some energy efficient appliances. The systems sold from \$2000 to \$10,000 but there was a 20% subsidy and 5-year loans offered.
- In 1973 Dominique Campana, a graduate student from Paris in the 1970s, came up with the idea of applying solar cells to pump water. French physicist Jean Roger translated her concept into a working prototype on the Island of Corsica.
- Father Bernard Verspieren had been running a mission in Mali and formed an NGO titled Mali Aqua Viva for providing wells for drinking water. After seeing the PV water pump in Corsica he introduced solar water pumping in Mali. The first system used **Solar Power Corporation** solar modules and pumps from **Pompes Guinard**. Later the pumps used were from **Grundfos** and the modules from many manufacturers.
- In March 1979 Wolfgang Paltz organises a Governmental conference "*The Sun in the Service of Development*" on behalf of the EU commission in Italy. Five regional seminars had been undertaken prior to the conference which raised the profile of solar as an option.

For more highlights, please refer to the [ISES SWC50 The Century of Solar Stories and Vision Booklet](#) or the [ISES Solar Energy Museum – Past, Present and Future](#).

Focus on Southern Africa

The Southern Africa Section of ISES was born on 2 December 1974 at a meeting of a steering committee in Johannesburg. This was followed by a symposium on 3 December. The Convener of the symposium was Chris Malan assisted by Will Cawood of the Council for Scientific and Industrial Research (CSIR); some 35 people attended. The steering committee comprised of Dr. Austin Whillier, Honorary president; Brian Schaller, Chairman; Will Cawood, Secretary; Dr. Richard Turner, Treasurer; Prof. Stefan Smoleniec; Prof. Neville Tully; Prof. Jack Gledhill; Prof. Dick Dutkiewicz; Doyle Liebenberg; Peter Lee; B. Thornton; and Benny du Plooy.

The origins of this meeting began in 1957 when Brian Schaller, a consulting engineer, joined the Association for Applied Solar Energy of Phoenix, Arizona. This became the Solar Energy Society, which shortly after became the International Solar Energy Society. Schaller attended the 1973 ISES/COMPLES/AFEDES Congress in Paris. ISES secretary Frank Hogg asked Schaller to consider starting an ISES Branch in South Africa Schaller then found Solar Pioneer Dr. Austin Whillier in Johannesburg. Dr. Whillier visited Schaller in Ladysmith, Natal, in August 1974. Austin was in favor of establishing the Society and offered to assist provided he was not asked to be president or chairman. He was already president of two South African learned societies.

In 1975 it was decided that this Society should serve the whole of Southern Africa and not just South Africa, as individual country sections would otherwise battle to survive for scarcity of members. Thus it was decided to call the ISES Branch the Solar Energy Society of Southern Africa (SESSA).

The first conference supported by SESSA was organized by Prof. Dick Dutkiewicz of the Energy Utilization Unit at the University of Capetown and took place in April 1975. It was titled "Energy and its Future in South Africa." Many members attended and some read papers at the conference. Dr. Hoyt Hottel of MIT in the USA attended the conference.

Today SESSA is known as the [Sustainable Energy Society of Southern Africa](#) and is dedicated to the promotion, use and development of renewable energy and energy efficiency.

ISES Solar World Congresses

The 1995 Solar world Congress was in Harare, Zimbabwe with the theme: In Search of the Sun.

The 2009 Solar World Congress was held in Johannesburg, South Africa with the theme: Renewable Energy Shaping our Future.



Sample of Pioneers Pre-1980

Each month this Newsletter will have a sample of people involved with renewable energy prior to 1980.

It is impossible to cover the thousands who have contributed to the development of renewable energy prior to 1980 in this monthly newsletter. What is included in each newsletter is just a snapshot of those involved. Those included in the newsletter are either taken from, or will be included in the next edition of the SWC50 celebratory booklet: *The Century of Solar-Stories and Visions*.

Dr. Gertrud Riemerschmid

Dr. Gertrud Riemerschmid: moved to South Africa from Germany in the 1930' to research solar radiation qualities. Her purpose was also to lay the foundations for research into the benefits of solar radiation on medicine and agriculture. She had worked briefly on similar projects in Central and East Africa. She worked with Dr. Grober, Professor Medicine Jenensis, on pyranometers, actinometers, ultraviolet dosimeters, and similar devices. In 1937 Riemerschmid went on to establish six solar laboratories around South Africa. Dr. Riemerschmid earned fame in many countries in Africa and South America in the few years before she died suddenly in 1942 in Pretoria.

Professor Dieter Holm

Prof Dieter Holm started his solar energy research in 1970. He pioneered the first energy and water autonomous house on the African Continent. Designed in 1973, prior to the first energy crisis, it was built in 1974 using solar passive design, PV, biogas, rainwater harvesting, recycling and vegetation. His PhD at the University of Pretoria entitled "The thermal effect of leaf cover on outside walls" blazed a trail for low-cost environmentally friendly exterior insulation that automatically varies with the seasons, tempering the microclimate by 4°C in summer and 3°C in winter of semi-arid climates. As Head of the Department of Architecture he introduced an eco-systemics. His books are focussed on Solar Passive Building in the Developing World. The architectural practice Holm & Holm Architects, and its successors, won many professional competitions and awards of merit. He served as ISES Board Secretary and contributed to the success of the ISES SWC in Johannesburg. He was commissioned to write an ISES White Paper "Renewable Energy for the Developing World" which has been translated into many languages and honoured with the Special Service Award This was followed by a Life Time Membership awarded after having served as Vice-President for Conferences. Currently he serves as director of ZZZ, a leading fresh product farming initiative, applying ecological systems theory through "Natuurboerdery."

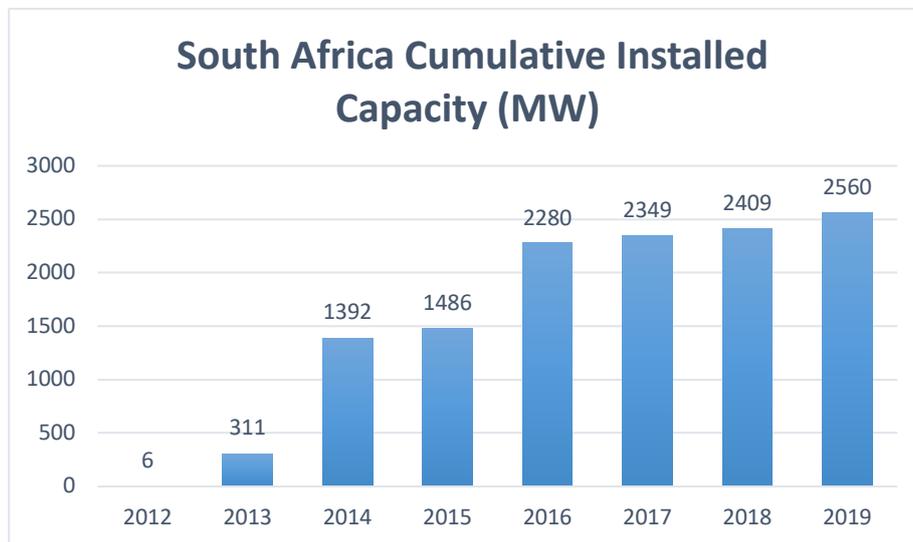
Derrick McDiarmid

Derrick McDiarmid began manufacturing solar water heaters under licence to Beasley Industries (Australia) in 1968. This led to the formation of Solamatics which continues in this field today. As PV became commercially viable, Derrick pursued opportunities for involvement in this field and installed a 3kW system for a rural hospital and several PV pumping systems in 1983/4. In 2008 the PV activities had grown so sufficiently that a separate company was formed (Ultimate Power Solutions) to provide better focus for the two activities. Derrick has been involved in developing standards in South Africa and Zimbabwe, and has attended ISES conferences in 1979, 81, 83, 87, 91, 93, 95 (as conference organiser), 2001, and 2003. Under Derrick's guidance Solamatics, with Danish Aid funding developed a PV vaccine refrigerator to WHO approval, and has installed several large institutional solar water heating systems in cooperation with a Danish company - Arcon Solvarme. Currently Derrick provides design guidance and consultancy for larger scale solar water heating systems for Solamatics and design for domestic, commercial and off-grid systems for Ultimate Power Solutions.

For the current edition of the booklet others from Southern Africa listed in the pioneer's section include:

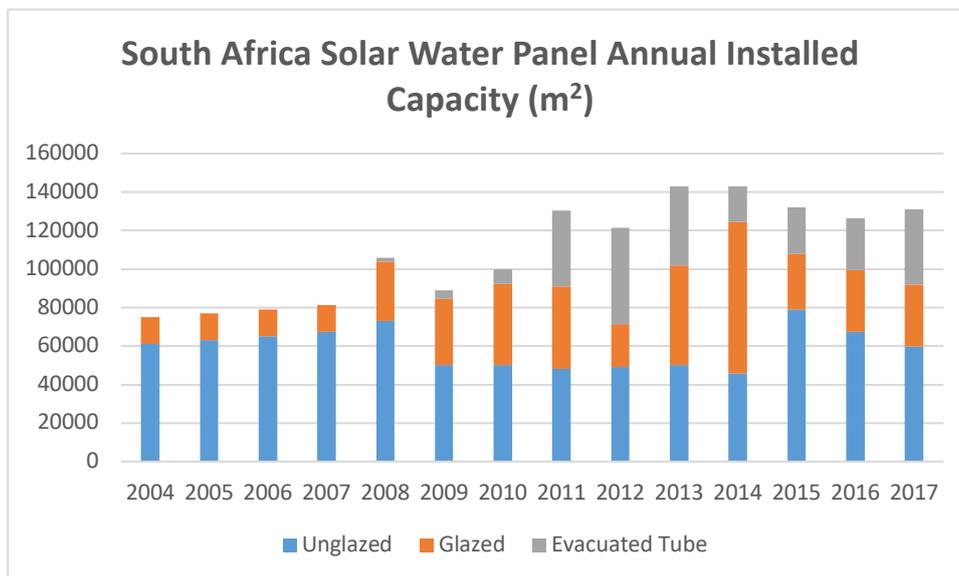
Name	Year Started	Country	Research or Industry
Jeff Stevens	1980	Zimbabwe	Industry

**Growth in Solar
Photovoltaics**

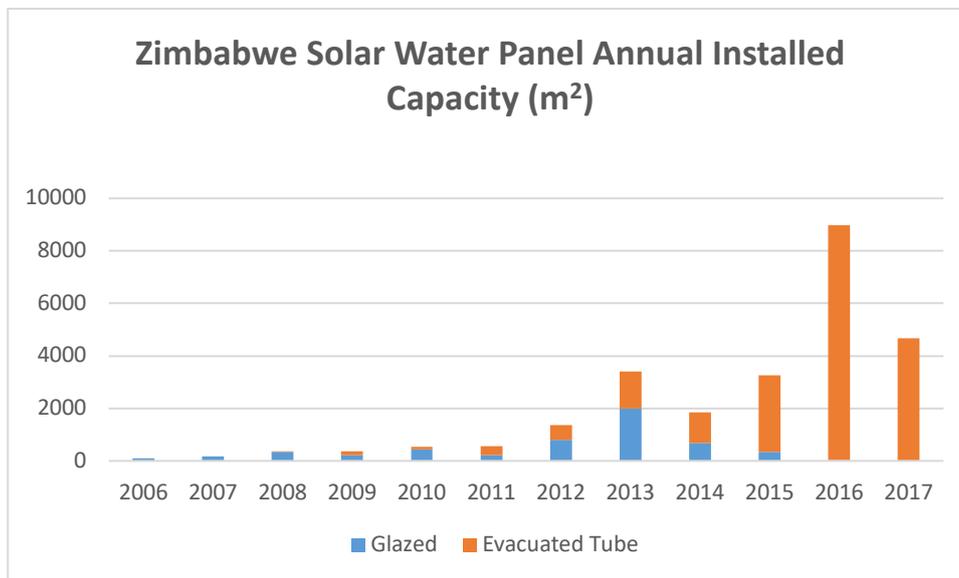


Source- IEA PVPS Trends Reports

Solar Thermal (Water Collectors)



Source- IEA-SHC Annual Solar Heat Worldwide



Source- IEA-SHC Annual Solar Heat Worldwide

Renewable Energy Pioneers

Without the efforts of individual researchers, system designers, system installers, business leaders, policy makers and those within the donor community, the renewable energy industry would not have grown from watts to Gigawatts in the last 50 years. ISES' way of acknowledging the many people was by issuing a call for the submission of Renewable Energy Pioneers to be listed in the celebratory booklet.

ISES will be releasing an updated version of the booklet in December 2021 and therefore **ISES is re-issuing the call for submissions of the names of individuals covering the following two categories:**

1. **Research Pioneers:** Individuals who started their research in 1995 or earlier.
2. **Industry Pioneers:** Individuals who actively started working in or with the renewable energy industry in 1995 or earlier.

Names and information can be submitted [here](#). Individuals can submit on behalf of themselves or on behalf of someone else, in particular for those who might have passed away. (**Note:** If you have previously submitted and are included in the current edition of the booklet, you will be included in the updated edition and do not need to resubmit.)

Partners of SWC50

ISES acknowledges the support provided by the Platinum Partners: GSES from Australia and NREL from USA; Gold Partner: Smart Energy from Turkey.

