Solar Pioneers Night

Foreword

In September 2016 Lindsay Hart, the late Richard Collins and myself were having dinner in Sydney. During the discussions I mentioned I had been invited by Sam Vanderhoof (Trace Engineering in the 1980s and 90s) to the third USA solar pioneers' weekend being held in Grass Valley California in October 2016. (The event went from the Friday and concluded on the Sunday, and it was very interesting hearing about the early days of solar in the USA). During the Sydney dinner there was a suggestion that Australia should hold one and the seeds for the first Australian Pioneers night were sown. The night was held on Friday 17th March 2017. It was organised by Kathleen Ryan, Lindsay Hart and Nigel Morris and all three took turns in being MC on the evening. During the night talks/presentations were given by:

Mark Thistlewaite	Mark Twiddell	Muriel Watt with Ted Spooner
Richard Potter	Sandy Pulsford	Brian England
Peter Bulanyi	Klaus Langer.	John Patel
Alan Langworthy	Tony Egan	David Jordan
Kim Atkinson		

During the memorial night for Richard held in May 2021, Lindsay and Geoff discussed holding this second night, 5 years after the first. Kathleen was contacted and the three started planning the second night. During one of the numerous meetings. The criteria for attending the night was that you had to be involved with solar in 1997 (25 years ago) however, Lindsay suggested that a representative from Solar Cutters should be invited, and Johann Fleury from Solar Cutters attended the evening representing the new wave of solar in this country. The following were also invited to represent their respective fathers who had contributed greatly to the industry

- Peter Watkinson - son of the late Stuart Watkinson, founder of maximum power point tracking manufacturer AERL,
- Alison Ciesla -daughter of the late Professor Stuart Wenham, former director of the Photovoltaics Centre of Excellence at the University of NSW (UNSW)

Michelle Taylor and Geoff Stapleton were the MC's for the evening and speakers included:

- Selectronic managing director Ken Scott on how his company transitioned from manufacturing transformers to making inverters.
- RFI executive director Steve Jaques on how his company originally specialised in radio equipment but moved into wholesaling solar products.
- Geoff Stapleton on how GSES became an international company undertaking capacity building projects based on the experience of its founders as volunteers with the Solar Energy Industry Association in the 1990s.
- Professor Martin Green from UNSW on his early PhD students, including discussing Professor Wenham, and his achievements in helping to reduce the manufacturing cost of PV systems.
- Preeminent solar researcher Dr David Mills talking about the early days of concentrated PV, solar cookers based on using evacuated tubes, and the research undertaken in Australia on the absorptive surfaces for evacuated tubes.
- Exemplary Energy executive director Trevor Lee on the Australian New Zealand Solar Energy Society (ANZSES), and he showed examples from 1997 editions of former industry magazine *Solar Progress*.
- Michael Harris from the University of Melbourne's Climate Energy College talked about the Alternative Technology Association (ATA) and presented sections of 1997 editions of *ReNew* (previously *Soft Technology*) , another solar magazine that was published at the time.
- Head of business development at Solar Analytics Nigel Morris and Selectronics' Lindsay Hart presented a discussion on the early days of Rainbow Power Company, that was founded in 1984 and remains a major player today.

The evening finished with Lindsay Hart interviewing Johann Fleury to gain his perspective on what he had learnt about the early days of solar in Australia.

In 1997 there were two magazines which those in the industry used to keep abreast of what was happening with this evolving and growing industry. These were **Solar Progress** published by ANZSES and **ReNEW** by ATA. Throughout this booklet we have included pages from the 1997 editions of these two magazines. I thank Trevor Lee and Mike Harris for granting permission.

I also thank the sponsors for the 2022 evening: Selectronic, Latronics, RFI, AERL and GSES.

Geoff Stapleton

Attendees in 2017

Kim Atkinson
Srinivas Bharadwaj
Julio Bragagnalo
Geoff Bragg
Christina Brassington
Ric Brazzale
Peter Bulanyi
Richard Collins
Klaus Coia
Brian Cooke
John Cooper
Richard Corkish
Gary Davey
Mark Diesendorf
Tony Egan
Brian England
Brendan English
Steve Garrett
Ernest Gavey
Barbara Goulter
Judy Green
Martin Green
Jenniy Gregory
Phil Hapgood
Mrs Hapgood
Mick Harris
Lindsay Hart
Oliver Hartley
John Inglis
Steve Jaques
David Jordan
Klaus Langner
Alan Langworthy
Duncan MacGregor
Graeme McIntosh
Nigel Morris
Susan Neill
Steve Nusco
Carlos Ogues
Fiona O'Hehir
John Patel
Dave Petrie
Robert Pitt
Dennis Pont
Diana Pook
Richard Potter
Sandy Pulsford
Kathleen Ryan
Mike Schach
Karen Schmidt
Ken Scott
David Skelton
Phillip Smith
Ravinder Soin
Ted Spooner
Alistair Sproul
Sue Stark
Tony Stockton
Rob Taber
Michelle Taylor
Frank Teofilo
Mark Twidell
John Vandeleur
Nick Wardrop
Muriel Watt
Rob Webb
Garry Williams
Luke Williams
Peter Wilson

The above is probably not a complete list because the original list could not be found and the above was developed from memory and a study of the photos. If you attended and are not listed, please send Geoff Stapleton an e-mail (gses@bigpond.com)

Apologies in 2017

Bruce Hanton
John Hall
Geoff Stapleton
Paul Edwards
Stephen Ingrouille
Lance Turner
Michael Valentine
Wayne Monkhouse
James Brown

Official Photographer – Blair Pester
Video interviews- Blair Pester and Kathleen Ryan
Emily assisted at door

Attendees in 2022

Sally Bartley
David Bartley
Peter Bradfield
Ric Brazzale
Ken Brown
Peter Bulanyi
Dave Christmas
Alison Ciesla
Klaus Coia
Paula Cooper
John Cooper
Richard Corkish
Brad Cowin
Tony Egan
Renate Egan
Brian England
Peter Erling
Johann Fleury
Ernest Gavey
Judy Green
Martin Green
Jenniy Gregory
Michael Harris
Liz Harley Erling
Lindsay Hart
Craig Hunter
Steve Jaques
Stefan Jarnason
Karina Kelly
Linda Koschier
Leon Langner
Klaus Langner
Trevor Lee
Iain MacGill
Chris Martell
David Mills
Nigel Morris
Steve Nusco
John Patel
Dennis Pont
Diana Pook
Audrey Potter
Rick Potter
Kathleen Ryan
Ken Scott
Sue Scott
Rod Seares
Mark Shakeshaft
David Skelton
Ravinder Soin
Alistair Sproul
Geoff Stapleton
Tony Stocken
Gavin Street
Rob Taber
Michelle Taylor
Frank Teofilo
Ron Tito
Sylvia Tulloch
Gavin Tulloch
Adrian Turner
Mark Twidell
Michael Valantine
Nick Wardrop
Peter Watkinson
Heather Watson
Stuart Watson
Phillip Wilson
Peter Wilson

Apologies in 2022

David Baggs
Alan Barker
Garry Baverstock
Grant Behrendorff
Trevor Berril
Ed Blackley
Andrew Blakers
Christina Brassington
James Brown
Brian Cooke
Mark Diesendorf
Mark Dewsbury
Dolores Dowdall
Max Enfield*
Brendon English
Mike Farrell
Barbara Goulter
Ken Guthrie
Bruce Hannam
Bruce Hanton
Oliver Hartley
Brain Hayes
Steve Helleur
John Inglis
Peter Jolly
Dwayne Lange
Alan Langworthy
Caroline Le Couteur
Bob McDonald
Graeme McMullan
Graham Morrison
Bob Mulligan
Sue Neill
Martin Nichol
Fiona O'Hehir
Monica Oliphant
Dave Petrie
Ray Prowse
Sandy Pulsford
Bruce Robins
Michael Rush
Richard Sale
Mike Schach
Zhengrong Shi
Ted Spooner
Phillip Smith
Sue Stark
John Vanderleur
Chris Wallace
Garry Williams
Luke Williams

Note * Max Enfield briefly attended on ZOOM

On Zoom

Kim Atkinson
Julio Bragagnalo
Stephen Ingrouille
David Jordan
Stephen Garrett
Rhys Morgan
Muriel Watt

Belinda Lam and Brandon Cook :On Door and Took Photos

ZOOM

Some of those who could not physically attend the 2022 Solar Pioneers night participated via ZOOM. Two of these were located overseas:

- Rhys Morgan in Wales
- Julio Bragagnolo in Argentina

Other ZOOM attendees included :

- Steve Ingrouille
- Kim Atkinson
- Stephen Garrett
- Muriel Watt and David Jordan
- Max Enfield for short time

During the evening many people went to the computer and spoke with those attending via ZOOM

Crowd Shots - 2022

2017

Brian England and Diana Pook -2017

Richard Potter speaking-2017

Gary Davey signing module 2017

Crowd Shots - 2017

Solar Progress
Volume 18, Number 4
December 1997

Solar Progress is published in March, June, September and December every year by the Australian And New Zealand Solar Energy Society Ltd ACN 006 824 148

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PUBLISHER
Australian and New Zealand
Solar Energy Society
ACN 006 824 148
Box 1140 Maroubra
NSW 2035 Australia

ISSN 0729 6436

Solar Progress is printed on 100% chlorine free paper and mailed in a 100% recycled paper envelope.

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COVER: Solar Ice Cream at the Floriade Festival in Canberra.

James Thier (Australian Ethical Investment) samples the product, and the young man just wanted the icy pole.


Solar hot water buyer's guide • Eco-tourism
ReNew
Technology for a sustainable future
Formerly
Soft Technology
Issue 58 Jan-Mar 1997
AUD$5.50 NZ$6.95
Wind farms in Australia and New Zealand
Planting a native vegie garden
Make a solar garden water feature
Solar Challenge • Renewable energy world wide
Make a wind measuring station • Green computing

Solar Overview of 1997

Australia

Total Cumulative PV Installed- Australia	**18,700 kW_p**	
• Off Grid- Domestic	4,860 kW_p	(26%)
• Off Grid – Non-Domestic	13,320 kW_p	(71%)
• On Grid Distributed *	200 kW_p	(1%)
• On Grid Centralised *	320 kW_p	(2%)

* Includes PV Systems on diesel mini grids

Total PV Installed in 1997- Australia	**3,000 kW_p**	
• Off Grid- Domestic	780 kW_p	(26%)
• Off Grid – Non-Domestic	1,800 kW_p	(60%)
• On Grid Distributed	120 kW_p	(4%)
• On Grid Centralised	300 kW_p	(10%)

World

Total Installed Cumulative Capacity **304MW_p**

Australia represents 6.2%

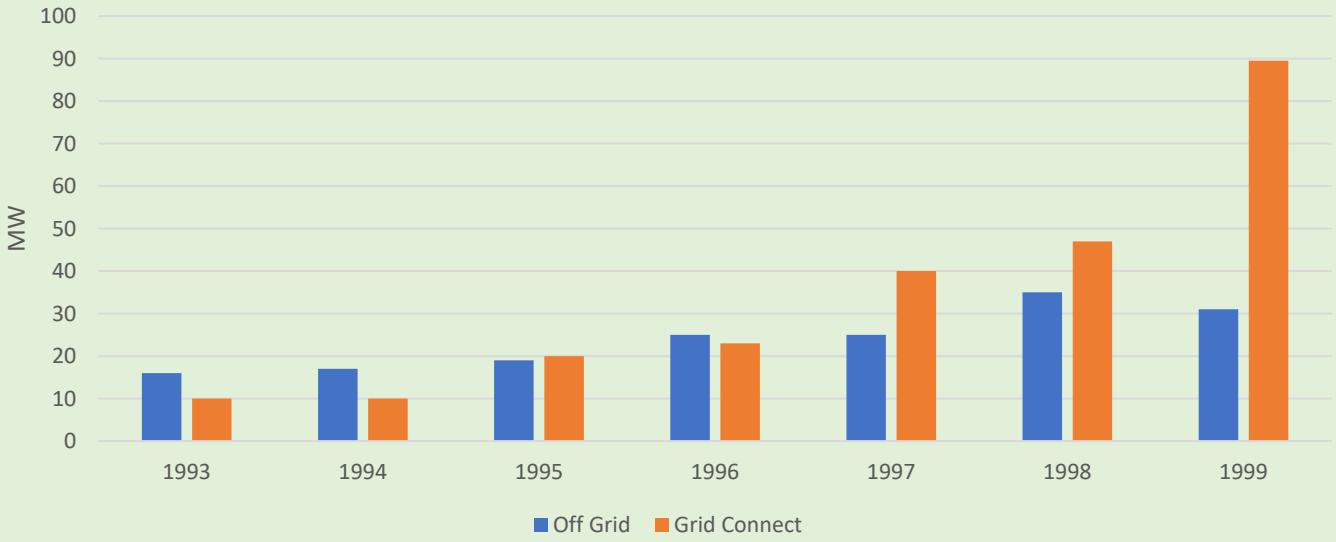
Total Installed in 1997 **65MW_p**

Australia represents 4.6%

Snapshot Australian PV Industry-

- PV production was 7.5 MWp per year and the industry generated business worth $91.5 M.
- Around 60% of PV produced was exported.
- 840 Jobs in the industry-50% in manufacturing
- Module prices were around $8/Wp,
- Grid system prices $10-12/Wp
- Off-grid system prices $20-40/Wp.

1997-The year grid connect overtook off grid in annual global installations-and remained there ever since



Source: IEA PVPS Annual Reports

Australian PV Manufacturers

- **BP Solar**-
  - at a launch at the Opera House announces a new 20MW factory
- **Solarex**
  - However later that year BP Oil acquires Amoco in USA which owns Solarex and end result there is a merger of the two manufacturers in Australia

Australian Potential PV Manufacturers

- **Pacific Solar**
  - Planned to have manufacturing capacity of 20MW_p thin film c-Si by 2000
- **Sustainable Technologies Australia**
  - Planned to have manufacturing capacity of 2.5MW_p titania nanocrystalline by 1999

Australian Inverters Manufacturers

Selectronic
AES
Solar Energy Australia (SEA)
Power Solutions Australia
Latronics
Siemens
Geebung
Magnum

Australian Solar Controller Manufacturers

Plasmatronics
AERL
Choice Electric
BP Solar

SEIAA/ATRAA

- Solar Energy Industry Association of Australia (SEIAA) president was Sue Neill
- Last year of SEIAA , following year (1998) SEIAA merged with the Sustainable Energy Industry Council of Australia to form the Sustainable Energy Industries Association (Australia) (SEIA).
- ATRAA held in Adelaide

Standards

- First Australian Installation Standard for Industry was released
- Technical committee comprised:
  - Richard Collins, Dave Bartley and Geoff Stapleton plus the EL5 secretary.

Other Interesting Facts

- The Kyoto Protocol was signed in December 1997
- The Federal government announced an increased 2% of new renewables on the grid by 2010 (what was to become MRET).
- In April 1997, eight NSW electricity distributors launched Green Power schemes
- Commonwealth government funding for PV R, D&D and market activities was $2.5 M per year and state government funding, including state owned utilities, was $9 - $12.5 M per year. The trend was away from device research towards development of commercial product and market programs. Industry funded R,D&D focused on improvements in components and system design. Joint industry and research institution activities continued in standards development and associated component testing.
- One State government offered RAPS (Remote area Power Systems) grants while there was an emergence of Greenpower programs, accompanied by an increase in utility PV activities.
- Several large PV systems had been installed on central and diesel grids,
- The main on-grid market was small distributed systems, with a 7.2kWp system on the SEDA building in Sydney being the largest.
- PV in NSW was expected to increase with grants for BIPV installations on residences and public buildings, aimed at encouraging schools and local governments to install PV systems for public demonstration and educational purposes, thereby increasing community knowledge and further encouraging market development.

Geoff Stapleton Opening the 2022 Solar Pioneers Night

Below showing the SEIAA T-Shirt from 1994

Peter Watkinson-Representing his late dad Stuart

What Should Have Been

By Ken Brown (former General Manager, BP Solar 1980 – 2000)

The 1990's were a watershed for the Solar industry. The early markets of remote power for telecommunications, infrastructure in developing countries and remote areas were still growing. But the industry was poised for an acceleration in its rate of growth. Driven by growing public awareness to Climate Change, Governments around the world made strong commitments to support alternative sources of energy.

BP Solar (originally Tideland Energy) had been operating in Australia since 1980. BP were committed to the industry with production facilities in Spain, India, USA, and Australia. Their demand for solar cells was increasing rapidly.

To fill this capacity in September 1997 the decision was taken to build a 20 MW solar cell plant in Sydney. The plant would produce solar cells based on the Saturn technology or "buried laser grid" invented by the University of NSW and commercialized by BP Solar. Land was purchased, approvals obtained, and the factory and equipment plans finalized.

As the shovel was about to be put in the ground and turn the first sod to commence building, 14,000 kilometers away in the USA, BP were in negotiations to purchase the oil company Amoco. As it happened Amoco were the owner of Solarex who had cell production plants in both the USA and Australia. The result was that management determined it prudent not to continue with building the Sydney plant. Australia lost out on building one of the world's largest solar plants at that time.

BP Solar went on to merge with Solarex and continued to manufacture solar cells from their Homebush facility. As production in China increased rapidly BP could no long keep up with the ever-reducing cost in manufacture. In 2010 almost thirty years to the day since Tideland Energy started production in Brookvale, BP Solar closed its doors in Australia. The closure was the end and loss of any significant cell manufacture in Australia.

Following photos of BP Solar systems installed internationally supplied by Dr Bruce Robbins-BP Solar Export manager in 1997 and unable to attend because he was in Pohnpei, Federated States of Micronesia where he is Energy Adviser

Michelle Taylor- Introducing Ken Scott - Selectronic-2022

Ken spoke about the early days of Selectronic, a company started by his father in 1963. He talked about how they moved into inverters in the early 1980's

Ken spoke about Lindsay's time at Selectronic and how it was his wife that told Ken to allow Lindsay to return after his venture with another inverter company… in the photos below follow the eyes Lindsay is sitting on the floor

Michelle thanking Ken at the end of his talk

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features

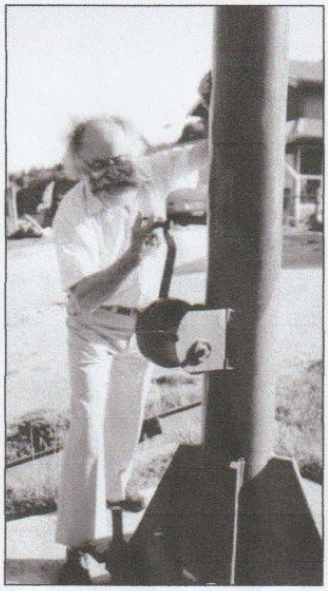

Photo: Michael Linke

Harold Ford explains what he is winching down this mast on page 30

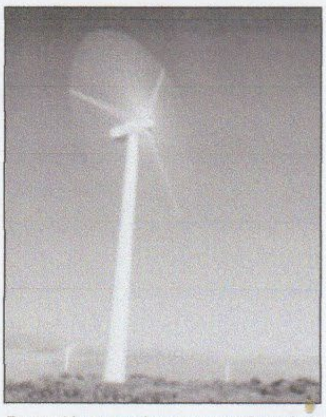

Photo courtesy Western Power

Renewable energy has an expanding role in the Greenhouse Challenge...page 34

The Wilpena RAPSS – 1997/98

By Monica Oliphant

Situated in the Flinders Ranges of South Australia, Wilpena Pound is one of the State's premier tourist destinations. In June 1997, the SA Government approved funding for ETSA (Electricity Trust of South Australia) to build, own, operate and maintain an off-grid solar/diesel power station to supply the increased load at the redeveloped resort at Wilpena. It turned out it was cheaper to do this than to construct a 10 km grid extension with powerline voltage upgrade that would have had to be partly underground through very rocky terrain in a National Park.

Prime Power of WA (Stephen Phillips) won the bid to build the 100 kW PV system with 400 kWh of battery storage. At the time it was the largest solar installation in Australia, and some said largest in the Southern Hemisphere as well! There were 1260 x 80W Solarex polycrystalline PV modules and Sonnenschein gel batteries. Backup was from 3 diesel generators - total capacity 550 kVA. The aim of the power station was to annually provide 40% of the Wilpena resort's power and offer unattended operation. Commissioning was in late 1998.

I found some notes I had written at the time when we were trying to find a site for the power station that satisfied a number of criteria, including not being seen from the road or be visible from St Mary's peak (a landmark of aboriginal significance and aesthetics for tourists).

> *"A community elder together with a young aboriginal student walked ahead of the rest of us, quietly searching the landscape for past remnants of their ancient civilisation. A burial site and a campsite discounted two of our potential power station locations and when we had almost given up; a suitable place was found. For me the day spent out with the Andyamathanha people was one of the highlights of the project."*

The solar/diesel power station, being a first, had many teething problems and was taken over by AGL at privatisation of ETSA in 2000. I left at that time also. I don't know the power station's current status but it provided important learning experiences for a great number of solar RAPSS that followed it.

Solar/Diesel Power Station at Wilpena Pound just after completion

Acknowledgements: Project Manager of the solar/diesel power station during the design and construction phase was former ETSA Renewable Energy Engineer Ms Vi Nguyen. She did a great job, but died, unfortunately, about 10 years later of cancer – much too young.

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Steve Jaques speaking about RFI-2022

Steve Jaques spoke about how RFI was involved with radio equipment and selling solar was a natural progression since remote radio sites was one of the large early markets.

Steve talking with Dave Christmas

Muriel Watt with Ted Spooner- presenting in 2017

2017

Phil and Robyn Smith- 2017

Nigel Morris presenting in 2017

Crowd watching presentation 2017

2017

Nick Wardrop And Martine Watkins 2017

Peter Wilson and Sue Neill 2017

Lindsay Hart Presenting-2017

Allan Langworthy, Mark Diesendorf and Ted Spooner-2017

Klaus Lagner and Nigel Morris 2017

Rick Potter Presenting 2017

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Regulators & Chargers

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Balance Of Systems

Clenergy · S-5!

Energy Storage

BYD · victron energy · CONCORDE · Drypower · sonnenschein

POWERPSONIC · INVICTA · CenturyYuasa · battery energy

Communications

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1300 000 734
solar@rfi.com.au

RFI003 Brochure_v6b.indd 1 13/4/21 10:21 am

Little Bay

By Ted Spooner

Little Bay research facility started as a solar architecture facility around 1993, but with input from PV and Electrical Engineering at Uni of NSW a band of keen contributors including: Muriel Watt, Ted Spooner, Hugh Outhred, David Roche, Michelle Taylor (nee Guelden), Iain MacGill, Rob Largent, David Jordan, Dave Bartley, Geoff Stapleton, Frank Martin and a bunch of others it was turned into a very effective facility for testing and demonstration of PV. As you can see from the photos there were a range of arrays including crystalline, multi-crystalline and amorphous arrays, trackers, batteries and a wide range of test gear.

Little Bay was the first licensed PV power generation facility in NSW connected to the grid. It was opened by the Minister for Energy on 1 Oct 14. He said it was in legislation that the minister must open any hew generator connected to the grid—he said he will be quickly changing that legislation!

The facility was used for many things including the first grid connected inverter testing and approval centre in Australia. We learned a lot and hopefully helped manufacturers learn a lot about their inverters. Some energy authorities also learned a bit about their network's voltage regulation ☺.

With a lot of testing experience under our belt, in 1996 with input from the ESAA and a committee comprised of utility and industry people, I drafted Grid Connect Guidelines for PV and they were made available to the industry in 1998. These guidelines significantly streamline the connection approval of inverters onto the grid throughout Australia. The guidelines later developed into AS4777 standards which is widely in use.

In 1997-98 at Little Bay we also undertook a lot of approval testing for inverters for the Olympic athletes' village for the Sydney 2000 Olympics and later when inverters were installed in the village we carried out harmonic and basic islanding testing in the village. It was exciting times for PV and was very important in making the eletrical utilities comfortable in accepting PV onto the grid.

A good time with a great bunch of pioneers!

Solar Pioneers – The 1998 Going Solar Renewable Energy Fair

By Stephen Ingrouille

Those familiar with the Australian PV industry in the 2020s with multiple wholesalers and industry expos occupying large areas of exhibition halls may be surprised that this was not the case in the 1990s. There was the odd product presentation at the typically annual Appropriate Technology Retailer's Association of Australia (ATRAA) meetings and most solar panels were supplied by just two main manufacturers that were then separate but later merged. As a retailer generally you were either a Solarex dealer or a BP Solar dealer.
My business, Going Solar (one of the four founding members of ATRAA) was established in 1978 when there few solar panels available to sell. Eventually we secured the rights to an Australian made panel called Tideland which in due course was taken over by BP. To help distribute these panels we established a strong network of dealers across Victoria and Tasmania.

By 1997 Going Solar would have been planning a renewable energy fair. We had heard of a thing in the US called the Mid-Western Renewable Energy Fair but (being pre-internet days) we knew little more about it and also had minimal experience in event organisation. We chose a site at a place called Musk near Daylesford in central-west Victoria, actually the front paddock at the home of one of our dealers. We planned a two day event to be held in 1998 with suppliers providing displays and exhibiting their products and drawing on the resources of our dealer network to help set up and assist in running the event. Importantly we included five marquees and a program of five streams of talks, again drawing on the expertise of our suppliers and dealers as presenters. Publicity (in pre-internet days) would have been via posters, local community radio and newsletters. We had no idea how many people would turn up.

The event site was established on a Friday and that evening a significant storm caused some damage but for the Saturday and Sunday we had the most perfect weather. Some 6,000 people attended over the two days (apparently causing Daylesford's first traffic jam) and the event took on a character of its own. Although we had planned displays, exhibitions, talks and food vendors, musicians and film crews just turned up and added a festive mood to the occasion.

Going Solar conducted a second fair at Hanging Rock in 1999 and from that the Sustainable Living Foundation was established. We handed the fair concept over to them which in due cause became the Sustainable Living Festival (which is still running in 2022, now as a national event. See: http://www.slf.org.au/about/history/).

First Accreditation Training Course-Bega 1993
Back Row : David Bartley, Rick Potter, Lindsay Hart, Bob McDonald, Stephen Garrett, Ray Prowse, Ron Tito, Roger Bunyan
Front Row: Tony Egan, Peter Browne, Stephen Ingrouille, Geoff Stapleton

2022

Karina Kelly and Steve Nusco

Peter Wilson Linda Koschier

Trevor Lee and Ron Tito

the

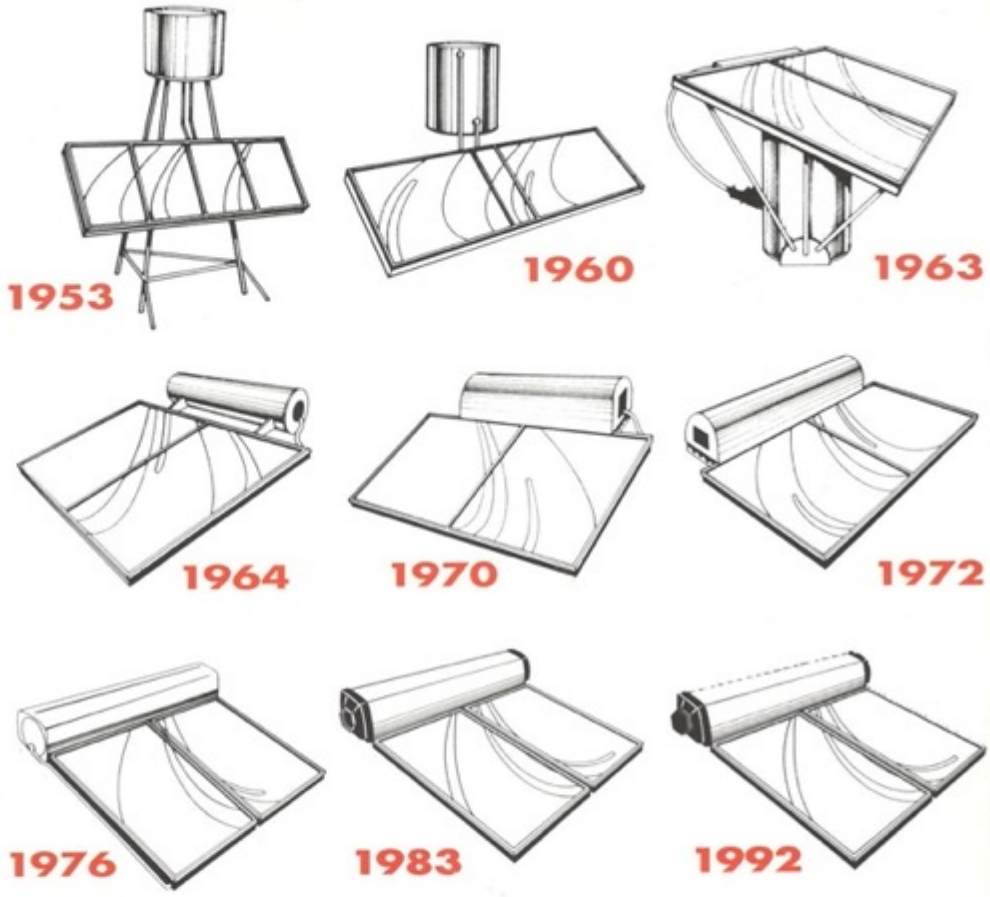
WORLD'S

BEST

always

GETTING

BETTER



The Black Chrome XII

TODAY

The Sorcerer

The Streamline

Solahart has developed a new generation of hot water systems including the Black Chrome XII which features superior technology and a 12 year guarantee. The new Solahart 'Sorcerer' utilises the 'heat pump' principle which is the basis of Europe's most successful hot water systems. The 'Streamline' gives all the benefits of solar heating without needing a water storage tank located on the roof.

Solahart

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Solahart Industries Pty Ltd A Johan Company ACN 064 945 848

SOL2612

issues

Remote area power system (RAPS) rebate schemes

Rebate schemes act as an incentive for people in isolated areas to choose renewable energy over grid connection. RAY PROWSE, Executive Officer of the Solar Energy Industries Association of Australia (SEIAA) explains the current schemes.

Remote-area customers are often faced with grid connection costs in the order of thousands of dollars. A well designed and installed RAPS system will typically cost from $10,000 up to $25,000, depending on the load that it is required to power.

A rebate often brings this RAPS system cost back to something which is affordable and is competitive with the cost to connect to the grid.

The interesting thing about rebate schemes is that they actually save the electricity distributors money. For example, in Queensland the $7,500 maximum rebate under HRAPS (household remote area power system) matched the distributor's average annual rural grid connection maintenance cost. In spite of this fact the Coalition Government, in its wisdom, has cancelled the scheme and is prepared to spend the average $7,500 every year.

Rebate schemes are not viewed by the industry as being the final answer to greater use of renewables. Whilst rebate schemes are operating, there is growth in the industry; when they cease, industry slows down dramatically. This has happened in both NSW and Queensland where the significant growth has fallen away now that the schemes have finished.

Rebate schemes are viewed by industry as a short term way of addressing some of the inequities in the provision of electricity services to rural customers. These inequities include falsely low quotations for grid extensions (for example, in Tasmania the HEC is effectively giving away grid extensions in some areas), heavily subsidised electricity prices (customers living in the shadows of power stations pay the same price for electricity as those hundreds of kilometres away) and an ethos of encouragement for grid extensions because we have abundant supplies of coal.

If these barriers are overcome we simply may not need rebate schemes. Privatisation of electricity utilities is leading towards true cost reflective pricing in all of their activities and we should see more realistic prices charged for grid connections and for each unit of electricity.

Until such activities lead to a 'level playing field,' rebate schemes will play a vital role in ensuring greater use of renewable energy technologies for those people for whom it is too expensive to take electricity from the grid.

For further details of SEIAA accreditation contact the Association on Ph:(03) 9866 8977, Fax:(03) 9866 8922, email: seiaa@ozemail.com.au

RAPS (remote area power system) rebate schemes in Australia

WESTERN AUSTRALIA

Status ..... Commenced in late September 1996.

Eligibility ..... Quote to connect to the grid must be at least $50,000. Rebate is on the renewable energy components of the system. System must be designed and installed by SEIAA accredited person or another approved by the Office of Energy.

Max rebate $8,000

QUEENSLAND

Status ..... Household (HRAPS) scheme for whole state has finished. Daintree (DRAPS) scheme likely to continue until at least February 1997.

Eligibility ..... Quote to connect must be at least $30,000. Rebate is on renewable energy components of the system. System must be designed and installed by an SEIAA accredited person or an Association member.

Max rebate ..... DRAPS - $15,000

NSW

Status ..... RAPAS scheme finished June 30 1996.

Eligibility ..... Quote to connect at least $30,000. Rebate on renewable energy components of the system. System must be designed by an SEIAA accredited person and installed by a licensed electrician.

Max rebate $8,000

VICTORIA

Status ..... REAP scheme will continue until the end of 1996.

Eligibility ..... Quote to connect must be at least $20,000. Rebate on renewable energy components of the system. System must be designed by an SEIAA accredited person and installed or inspected by an accredited person.

Max rebate $3,000

No other states currently have schemes operating.

Geoff Stapleton talking about GSES

Geoff Stapleton talked about the seeds for GSES being sown in 1997 before it then commenced as a company in 1998. The original aim was to was to support small companies based overseas, however it soon became a capacity building company focussing on training, guidelines and standards. What the founders of GSES had been doing in the 90s with their involvement with SEIA had become an international business.

Wauchope Solar

By Stuart Watson

Australia's First Solar Powered Community FM Radio : 2Way FM Wauchope NSW
2 way FM first commenced broadcasting from Mt Cairncross In 1991 .
With an enormous community effort, it was Solar powered using just 6 40-watt Solarex panels and 4 BP solar 80-watt panels.

Cobbled together using Plasmatronics shunt regulators and SAFT Nickle iron batteries obtained from a substation in Port Macquarie fortuitously after a builder's truck collided and wrecked their battery room.

A 20-watt nominal FM transmitter coupled with a home brew 900mhz studio to mountain link was placed in a box on the forestry tower. A home-made 4 dipole array gave 13dBi focus towards Wauchope and Port Macquarie. With a nominal 24v power supply varying from 18 to 32v the power and subsequent listener catchment area varied massively from day to night!

2 days autonomy was possible and our remarkable "on air alarm" consisted of audible pips sent over the program material once battery volts fell to 19v before imminent collapse!

The ultimate feedback loop was used and annoying 1khz peeps interfering with the program content and listeners would call in! The single cylinder back-up generator was summoned using a sigtec 2way radio module with the bonus of a live onsite microphone open for ten seconds for audible feedback to hear the diesel crank and start. Pre smart phone or internet access … Selectlive eat your heart out!

2way FM Still broadcasts from Mt Cairncross albeit mains powered and co sited with commercial broadcasters and mobile phone towers. Solar power still provides emergency backup, and this site was truly pioneered with solar in $10 a watt days.

Wauchopesolar emerged from this work and from local off grid users with inspiration from Self Sufficiency Supplies in Kempsey and the BCSE.

Wauchope solar still works locally advertising on 2way FM!!

2022

Martin Green, Richard Corkish and Michelle Taylor… UNSW connection

Mark Shakeshaft crashing in in background!

Dave Skelton , Ken Brown, David and Sally Bartlet- BP Solar connection

Geoff Stapleton, Jenniy Gregory, Richard Corkish and Ric Brazzale

Peter Wilson Nigel Morris and Kathleen Ryan

2022 Photos

Audrey Potter, MIck Harris and Rick Potter

John Cooper and Brian England

Linda Koschier, Alison Ciesla and Michelle Taylor

Peter Bulanyi, Craig Hunter and Tony Egan

Nick Wardrop and Peter Bradfield

First Grid-Connect Solar Systems in SA

By Sandy Pulsford

In 1997 I was running Solaris Technology in Adelaide. We had been operating since 1995 installing off-grid solar systems for households and eco-tourism facilities and manufacturing solar power systems for the Moomba gas fields. We had just finished installing a solar power system for a research station on the Great Barrier Reef.

We were approached by an active environmentalist, John Smith, who was a curriculum advisor with the SA Education Department. His was able to secure grant funding to install grid connected solar power to three schools as a teaching resource and to raise understanding of renewable energy.

Solar Sense House Newhaven

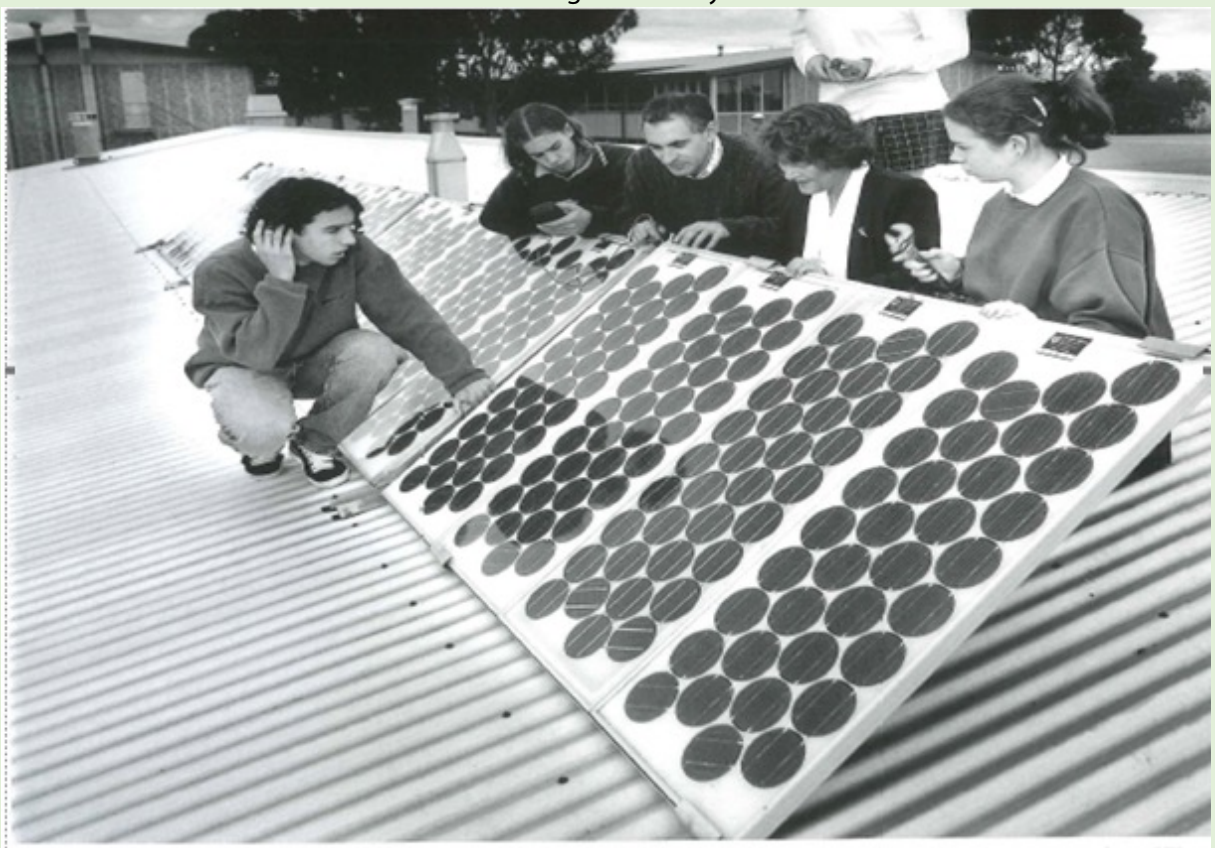
Power Solutions Australia had redesigned their remote area power supply (RAPS) inverter for grid connection. At the same time Monica Oliphant, senior research scientist at Electricity Trust of SA (ETSA), was working with other utilities in the Electricity Supply Association of Australia (ESAA) to publish guidelines for grid connection of solar power.

These draft guidelines represented best practice at the time and became the basis for the AS 4777.2 and .3-2002. As a result, we were able to install the three 1 kW systems at Highgate Primary, Findon High and Brighton High schools using Power Solutions SGB inverters and Australian-made Solarex panels. Power Solutions was later bought by Selectronic and the technology further developed for their SP PRO inverter range.

Each system was inspected and tested at commissioning by network engineers from ETSA and they were the first grid connect systems installed in South Australia, and some of the earliest in Australia.

An ETSA R&D project by Monica Oliphant at the time was a demonstration 1 kW roof-integrated grid-connect solar system for a 2-story house in a housing development at New Haven. The system was installed the following year due to delays in manufacturing. It used a sheet-metal tray under the array for water-proofing and was designed to look similar to the solar hot water panels for aesthetic appeal.

Findon High School System



The first grid-connected photovoltaic system in South Australia was installed at Findon High School with assistance from ETSA Corporation. Monica Oliphant, principal energy research scientist, and Rod Hunter, the school's technology studies teacher, explain the principles of solar energy to students (from left): Doug Perac, Kris Sorensen, Helena Carneiro (standing) and Belinda Hicks.

Lindsay Hart and Nigel Morris talking about Rainbow Power

Dave Christmas (below), one of the founders of Rainbow Power was in attendance however it was fair to say he was not keen on talking so instead Lindsay Hart and Nigel Morris discussed their experiences with Rainbow Power-one of the early companies (formed 1984) and still going today

CADDET: The ANZSES "connection" an easy way to international attention and market presence

Trevor Lee describes the higher profile that CADDET is taking in Australia

In the last *Solar Progress*, we advised you of the new arrangements for CADDET in Australia. CADDET is the IEA's Centre for the Analysis and Dissemination of Demonstrated Energy Technologies which is a bit of a misnomer now as there are two distinct, if co-operative, "Centres"—one in the Netherlands focussed on energy efficiency and one in the United Kingdom focussed on renewable energy.

The article then talked of the principal contractor, Energy Strategies Pty Ltd, which is responsible for the dissemination of CADDET information in Australia and the collection of internationally significant Australian data for dissemination world wide. Of more than passing interest to ANZSES members, however, is the junior partner in the winning consortium, Energy Partners.

Energy Partners is headed by Trevor Lee and Peter Lyons, well known to readers as the current ANZSES Chairman and Committee Member respectively. Their role is to provide specialist advice and interpretation to the CADDET Australia team on renewable energy in general and building applications in particular and as such provide an excellent conduit for getting the projects of ANZSES members onto the world stage.

"ANZSES often concentrates on cutting-edge work which would not be considered suitable for CADDET", says Trevor. *"You have to remember that the second D stands for Demonstrated so that R&D results are not what we are seeking—but demonstration projects, including novel applications of established technologies, are ripe for inclusion on the CADDET Register."*

The CADDET Register is a database of demonstration projects over the past decade that is available to relevant clients, professionals and interested lay people for searching by keywords. Currently it is dominated by northern European projects so that manufacturing processes and cold climate building technologies get a disproportionate amount of space. The Australian team is committed to getting more primary industry and temperate and tropical applications on the Register. For example, there are no mining industry energy-efficient technologies listed yet.

Easy Listing

The current team was selected by the Commonwealth Department of Primary Industries and Energy, who fund Australia's participation in CADDET, partly for their proficiency in technojournalism. So firms wanting to get their innovations listed don't need to hire a journalist to make it happen. All they have to do is put the bare facts before the team and they will prepare the material for the firm to check before it is sent to Netherlands or the UK for formal listing.

"Getting listed is only the first stage of much wider promotion", Trevor pointed out. *"The better projects and innovations get adopted for specialist four-page brochures and/or inclusion in the quarterly magazine which is distributed throughout the OECD* (Organisation for Economic Co-operation and Development—the industrialised market economy countries including Australia and New Zealand). *The CADDET Australia team will handle that too, at no cost to the firm, if required."*

Worldwide Exposure

The significance of the CADDET Register as a marketing tool for low energy technologies has only recently been grasped by the IEA which has historically restricted access to it for technology and know-how searches to OECD members only. They have only now realised that this keeps our "advertising" from being seen by our best prospective customers. So accessing the Register is soon to be open to all—just like the GreenTIE* Directory always has been. This makes it all the more attractive to Australasian firms to get their work listed as it will soon be searchable by our northern neighbours where our best chance of large exports of renewable energy technology rests.

The CADDET Renewables Register has been accessible on the internet since August 1995 and now receives about 25,000 "hits" per month. It has over 300 entries but last year Australia only managed to add two new entries and was falling behind the field despite the

The CADDET Australia team lining up to get more Australian renewable energy technologies into the Register are (from the left) Peter Lyons, Trevor Lee, Hugh Saddler, Penny Philp and Michael McCann. Missing at the time of the photo was electrical engineer and Project Manager, Bob Beatty, (known to many as the founding editor of "Electricity Week"). Trevor and Peter are well known to readers through their participation in the Australasian governance of ANZSES—Trevor being the current Chairman and Peter being one of the six members of the Committee elected by the membership at large.

Other Australian grid-interactive houses in Australia

Solar One, Sunshine Coast, Queensland

Back in Soft Technology issue 51 there was a story about Solar One, a project house in Queensland that had just begun selling electricity back to the grid.

The project, funded by the South East Queensland Electricity Board (SEQEB) and the Australian New Zealand Solar Energy Society (ANZSES), had two main objectives. ANZSES wanted to promote energy efficiency in the home, by demonstrating low power consuming appliances and fittings and other aspects of energy efficiency. Gas boosted solar hot water, compact fluoro lighting, and passive solar design were all integrated with the solar power system.

For SEQEB, the project provided the opportunity for a trial of Queensland's first solar grid-interactive system. Using only Australian-made equipment, Solar One's system comprises:

- a 1.3kW solar array, using 16 Solarex 83 watt panels connected in series/parallel to produce 96 volts DC.
- A 1.5 kilo-volt amp grid-interactive inverter from Butler Solar.

The project was for a two year period, over which time SEQEB monitored all aspects of the system. Over this time the system exported back to the grid about the same amount of power as it used.

The project test period has officially finished, and the data collected over the two year period has formed the basis of SEQEB's 'Buy Back Policy'.

This policy includes rates for grid connection by private generating souces and an agreed 'buy back' rate. What this means is that if anyone is thinking of putting in a solar grid interactive system in Queensland, the peak rate would be the agreed rate for electricity purchased by an electricity utility.

For further information on selling electricity back to power authorities in Queensland write to Mr Graydon Johnson, SEQEB, GPO Box 1461, Brisbane 4001, or phone (07) 3407 4130.

by Paul Edwards. Paul was one of the installers of Solar One's solar power system.

Tracking the sun in Canberra

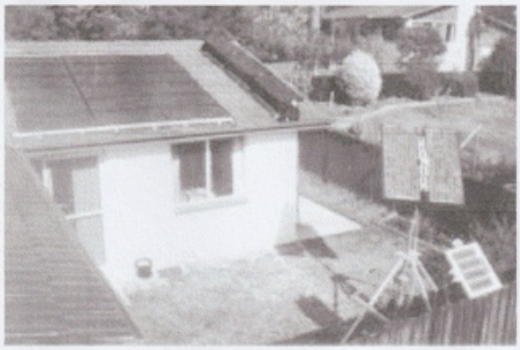


Photo: Peter Bachman

Peter Bachman's backyard in Canberra may look like a postmodern art installation, but it is actually a trial area for various solar equipment. The 1,000 watt stable array (on the left of the roof) provides most of the power, which feeds excess electricity into the grid through a CSA 2500 inverter. At night, or on less sunny days, power is drawn back from the grid.

Peter is a solar tracking enthusiast. The panels near the fence, and those on the right hand side of the roof (also pictured below) are all connected to different tracking systems.

A tracking system allows an array of panels to follow the movement of the sun during the day, and therefore get greater power output from them. The roof-top tracking system comprises three panels bolted together and guided in four bearings, with a total rotation of 120°. A small gear-motor drives the setup from east to west during the day, and returns it to the east once the sun sets.

Up to 30 percent more electricity can be gained from using the trackers, and on a sunny day the three 80 watt panels generate around 1.5 kWh of electricity.

Peter Bachman manufactures two different solar tracking controllers, both of which have been installed on tracking systems Australia-wide. For more information, contact Peter Bachman: Electronic Lab, 11B Mawson Dve, Mawson ACT, 2607. Phone/Fax: (06) 290 1639.

Photo: Peter Bachman

The 90's Decade

By David MIlls

After working at the University of Sydney on solar cookers, collector optics, absorber coating performance limits and solar process steam systems in the 1980s, I secured federal funding for a spectrally selective coating project late in 1989 and hired the brilliant but almost incomprehensible Dr Qi-Chu Zhang, a recent PhD UNSW graduate who discovered superior two-layer geometry during our project. The work continued for about 10 years with IP rights finally sold to China in 2004. This work revolutionised absorber coatings and became the ancestral basis of many high temperature evacuated tube coatings used today.

In the early 1990s I also started work on significant improvements in focal size and field density for compact linear fresnel reflector (CLFR) high temperature collector systems. When tSydney University declined to defend the IP, Prof Graham Morrison and I formed a company, Solsearch, and defended the IP with our own money. A pilot project at Stanwell was begun, but aborted after the Queensland government killed their own energy research body in the late 1990s. We recovered the IP again and it continued through the companies SHP, Ausra, and Areva Solar. Today there is one large 100 MW Areva Solar installation in India and more recently, multiple 50 MW LFRs in China based using similar LFR technology.

From 1997, Solsearch also designed the unique optics of an evacuated tube hot water system for Solahart. This was produced and sold in Germany for a few years before succumbing to cheaper evacuated tube systems direct from China. It was the most efficient DHW collector ever tested by Germany at the time. The last one is on our roof in Roseville.

In 1992 I was elected an Australian director for International Solar Energy Society (ISES), with 4000 direct and 20000 associated members. I worked on NGO relations for the pre-Rio conference at the UN building in New York and was later elected vice-president of ISES in 1995 and president in 1997. However, ISES finances were in poor shape. I initiated the process of locating a donor to buy Villa Tannheim in Germany as a home for ISES and also developed ideas for extensive organisational and financial restructuring that needed to be ratified by the 1997 ISES conference in Korea. I also had supervised the planning of that very conference since 1995.

On August 16, Karina gave birth to our second son Max in Sydney. Two days later I was elected the new ISES President / Board Chair. A week later I had to leave Sydney for the critical 1997 conference. It was very bad timing; thankfully. Karina's mother moved in for some week to get her through. Possibly the best-timed mother-in-law move-in ever.

What was Muriel doing in 1997?

By Muriel Watt

In 1997 I worked on the first ***PV in Australia*** report, initially a book published by the ERDC, and then the first of 20 IEA PVPS status and annual reports I worked on– with many contributors – until 2014. It was also the year the IPCC met in Kyoto. The Australian Government was seeking input to programs they could announce and many of us worked on ideas for what would become the MRET, the PV Rebate Program and the RRPGP.

I was also involved in two broad area of research at UNSW: ***life cycle assessments*** (LCAs) of PV and the potential for ***PV in Buildings***, and the issues associated with distributed generation. The findings were presented by me and my colleagues at workshops and conferences in Utrecht, Barcelona, Newcastle and Canberra. They included LCAs of inverters, as well as grid and off-grid PV systems; legal and regulatory implications of adding PV to buildings, as well the first assessment of the NSW PV rooftop market size.

The late John Kaye, with Mark Ellis and Dorothy Remmer working on Life Cycle assessments in ~1997

Memories of 1997

By Kathleen Ryan

In 1997 I had been at Pacific Solar two years, since the beginning of the Company which had started in February 1995.

Originally starting off with a grant of $45M and then receiving lots more funding meant that in 1997 Pacific Solar was growing fast and hiring staff to research into thin film.

I always was the Management Meeting Secretary which met every Friday and I had to get a research highlight from Professor Martin Green to send out with the Minutes.

I worked as David Hogg's (MD) Secretary, Dr Zhengrong Shi's Secretary, was the Receptionist and then as these roles expanded a permanent employee was hired and I would then go and work in another growth area or relieve any administration role when needed!

I remember late nights helping to prepare for grants and a lot of typing of reports which showed the outcomes of the research into thin film. I was on the safety committee.

I eventually went to work for Dr Julio Bragagnolo who had been requested to come up with a prototype of a solar kit and create a sales team to sell Plug &Power.

I just assisted, when needed, in a very fast changing and expanding Pacific Solar.

I had two babies in nappies as well!!!

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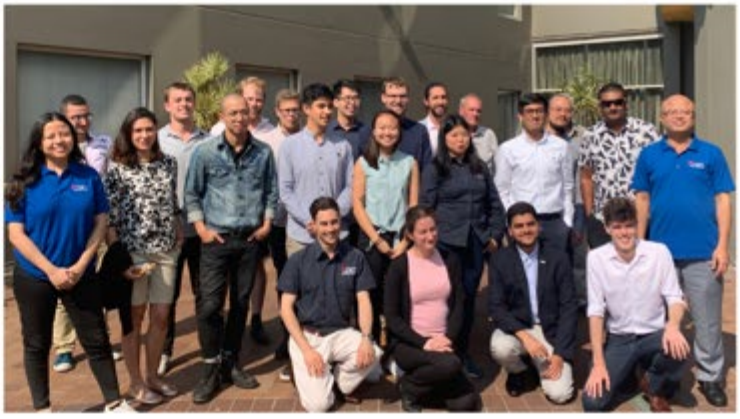
Thank You



The GSES staff would like to thank the solar pioneers from the 20th Century for creating an industry that has a great future and provided us the opportunity to have work in this field.

Creating sustainable change through
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Breamlea Wind Turbine and me.

By Nick Wardrop,

Project Engineer with the Victorian Solar Energy Council, 1986 - 1990

When I started with VSEC in 1986, my colleagues had started a wind monitoring project along coastal Victoria. They had been told that Victoria didn't have any wind potential to speak of, going by BOM records, which were mainly in city locations or at airports. In 1986 at the conclusion of the study it was found that we had a promising wind resource at most of the monitoring sites.

It was decided that a demonstration grid connected wind turbine (jointly funded by VSEC and the state electricity utility SECV) should be erected as proof of concept. The site chosen was at Breamlea, close to Melbourne for ease of access. Unfortunately, the first grid connected wind turbine (WT) at the Mars confectionary factory on the outskirts of Ballarat had self-destructed when it overspeed in a wind storm. This was an early 3 bladed upwind design with similar yaw control to Dutch flour mill designs, and was disconnected from the grid at the time. This event did not enamour SECV with the reliability of wind power.

After a false start with a Victorian company who had undertaken to manufacture a wind turbine and the loss of some state and federal funding, a wind turbine from Westwind of WA was chosen. It was a 3 bladed horizontal axis design similar to the Nordtank WT on Rottnest Island, but with many improvements. Westwind had been contracted by the WA government to build six 60kW turbines for a small wind farm to be located at Esperance, which had an isolated diesel grid. Westwind was contracted to produce a seventh WT for our project.

This turbine was commissioned in November 1987, and although many in the State Electricity Commission of Victoria (SECV) had doubted it would last, it was still standing in 2021 when I last visited the site. Subsequent studies and wind mapping around Australia has found we have one of the best wind resources in the world (as we have solar resources). The proliferation of wind farms is proving that the technology offers an economic, clean alternative to providing electricity for Australia. The vision of the VSEC chairman, Professor Bill Charters, and his team at VSEC, together with the support of SECV, led to the success of the Breamlea demonstration WT. I had long thought that Renewable Energy was our only long term, environmentally sustainable energy source, since taking an environmental unit in 1971 during my 3rd year Electrical Engineering degree, and was proud to be part of the development of this new energy source. After leaving VSEC in 1990 I worked as Renewables Project Officer for 6 years in the Energy Division of what is now the Pacific Islands Forum Secretariat (based in Suva, Fiji).

The Breamlea WT is now the oldest surviving WT in Australia at a third of a century, has outlived the State Electricity Commission of Victoria, and deserves to be preserved as part of our Engineering Heritage.

Cycling past Breamlea 60kW, 22m WT in March 2021

WT with one tip spoiler deployed, monitoring tower behind with 10m and 22m anemometers.

Martin Green Speaking about UNSW Research Labs 2022

Martin Green spoke about early days of the UNSW PV Lab and in particular the contribution the late Stuart Wenham had contributed to ethe industry.
Stuart was represented on the might be his daughter Alison Ciesla

2022 Michelle Taylor talking with Martin Green Renate Egan

Michelle Taylor speaking with Linda Koschier and Alison Ciesla (Feet of her new son can be seen)

Matt Thistlethwaite - Federal Member for Kingsford Smith Speaking

Klaus Langner Speaking about Latronics first inverters

Sandra Stocken, Frank Teofilo and Tony Stocken

2017

Stephen Garret talking to Peter Wilson

The Early Days

By Ron Tito, Wildwood Wind and Solar

I started my business Wildwood Wind and Solar in the 80's – and in those days the only way you could get information on products was from your wholesaler or the manufacturers or occasionally from magazines like "Earth Garden" and "Grass Roots".

In November 1988 I attended my first ATRAA conference in Kempsey, hosted by Self Sufficiency Supplies and it was attended by 7 other businesses. There I found out that others were having the same difficulties finding information on products, what was good and what wasn't. I met other retailers from my region and in those days, we didn't regard each other as competitors – anybody selling in the industry was a good thing for the industry overall. We came to support each other over the years.

Tony Egan from "The Energy Shop" in Goulburn and I would often do Field Days together, and when we got enquiries from customers we shared them to the relevant areas for follow up. We worked so closely together that we would even help each other out on larger jobs – for example, wind turbine installations and larger solar installations calling on each others particular areas of expertise. We even used joint buying power to get better deals from suppliers.

You can see by this photo, here we are at Tony Egan's own house installing a wind turbine with Bob McDonald from "The Solar Powerhouse" in Braidwood and myself.

Ten years later at my last ATRAA/SEIAA conference in 98 there were some 40 businesses in attendance, and this is only a fraction of the industry today. It's important to note that industry in the 90s was very different and without the support of each other we may not have been able to maintain our successful businesses.

Selling Grid Connect systems in the 1990's

By Geoff Stapleton

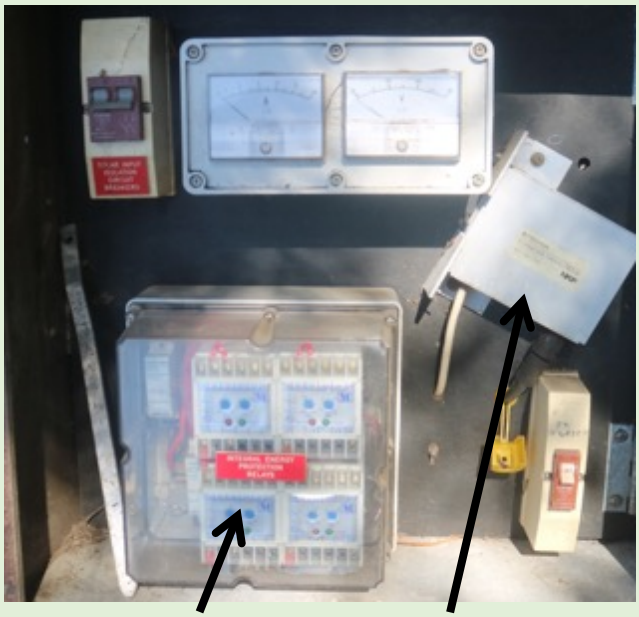
In 1996 I started consulting full-time with Integral Environmental Energy (IEE) (originally with Illawarra Electricity before the merger with Prospect Electricity). In 1995 I was part of a study tour of the USA with John Roach and Robert Grimmett visiting electricity utilities in the USA and investigating their involvement with PV. One was the Sacramento Municipality Utility District (SMUD) which was installing 4kW grid connect systems on households. As a result, IEE decided to promote the installation of grid connect systems and the SUNPOWER program was developed and launched in 1997. It took 12 months of negotiations to obtain the permission from those managing the distribution network.

One of the problems though was at that time, beside PV modules being about $9 to $10 per W retail, it was approximately $4000 for a 1kW inverter. While in the USA in 1995 IEE joined the Utility Photovoltaic Group (UPVG) who held its conferences in conjunction with the USA SEIA conferences. I attended conferences in 1996,97 and 98. However at the 1996 conference I met Henk Oldenkamp who had developed the 100W module inverters(designed for 2 x 60- watt modules in series). IEE Became the Australian distributor.

The SUNPOWER program was a net billing program. The metering arrangement was similar to gross metering, that is separate meters for the load and the PV generation. The system owner was paid the same rate per kWh for their generation as they paid for their electricity (load) up to the point that were net exporting during a 2-month billing period. They would then be paid $0.10 per kWh for any net export. The separate meters were used to allow IEE to monitor the exact production from each of the systems installed plus to ensure total energy usage information was still collected. This was to minimise the risks of disputes in the future if a customers' loads increased and the customer thought their increased electricity bill was because the solar system was not operating correctly. This happened once where the customer did not realise adding the second air-conditioners would increase their energy usage!

Unfortunately, when the SUNPOWER system was launched there were no interconnection guidelines and though the OKE 100W inverter did have over/under voltage and frequency protection, we were forced to install extra individual over/under voltage and over/under frequency relays as shown in the photo below. In addition, a warning sign using individual yellow letters had to be installed on the LV distribution transformer pole for the transformer that was connected to the PV System. I installed my l120W system in 1997 and the sign is still on the pole—I took the photo below this year.

The first time line work was undertaken in my area where the power was being turned off, the linesman came around to my house and said, "*We know it is supposed to turn off Geoff, but we want to be safe, we are turning off all switches on your switchboard and will be back this afternoon to turn it back on*". Fortunately, times have changed.



Protection Relays 100W Oke Inverter

Warning sign on Transformer Pole-Installed 1997 still there in 2022

David Mills Talking Solar Thermal Development but also early concentrated PV

Karina Kelly, David Mill and Judy Green

2022

Gavin Tulloch, Philip Wilson and Sylvia Tulloch

Klaus Coia and Brian England

Trevor Lee, Ron Tito and tony Egan

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MPPT Solar Charge Controllers

CoolMax SRX Solar Charge Controllers feature over 35 years of MPPT innovation, offering a superior tracking algorithm with an ultra-low loss, high-efficiency thermal design, backed by our Australian factory warranty and local support.

With record-breaking conversion efficiencies, intelligent thermal management, and state of the art MPPT tracking, the SRX is a key component of any high-quality DC-Coupled remote power system.

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1584W @ 24V | 3168W @ 48V

SRX 600/70-48
2016W @ 24V | 4032W @ 48V

SRX 600/30-120
4320W @ 120V

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1997

By Jenniy Gregory

For me, 1997 was certainly being in the right place at the right time and an extremely busy year. Working for IT Power as Market Development Manager, I was also the founding Secretary General for the British PV Association (PV-UK), Chairperson of the UK Solar Energy Society and on a number of sustainable energy advisory committees.

In 1997 *Financing Renewable Energy Projects: A Guide for Development Workers*, was published, with myself as lead author. This book examined how to unlock local non-formal financing in regional areas, taking seed bank funding as an example and applying it to how local communities could finance the purchase of small PV home systems projects, and, in doing so, potentially increase the wealth and well-being of those After researching and promoting local financing solutions to unlock accessibility to PV-powered electricity in regional areas of the developing world.

In 1997, the World Bank group was also taking the access to PV-powered solar home systems (SHS) as a serious facilator to increase health and well-being of people in non-electrified areas.

The aim of the *PV Market Transformation Initiative* was to significantly accelerate the commercialisation, market penetration and financial viability of PV technology in developing countries. IT Power won the tender to development the business plan and strategy development. The resulting initiative, financed by the Global Environment Fund, became operative in Kenya, Morocco and India.

Another initiative by the group was the Solar Development Corporation, the objective of which was to accelerate the growth of private firms and deepen the penetration of SHS and other rural PV applications by providing access to pre-commercial and parallel financing for private firms. Fourteen developing countries were researched in Asia, Latin America and Africa, developing the business case for future financing of PV projects in these countries. I was responsible for the in-country mission to and report on The Philippines, and review of the final reports for the other countries.

Back in Britain, PV-UK was developing a presence lobbying the government to increase spending on both R&D and market development of PV. A significant publication in 1997, *Photovoltaics in the UK: facing the Challenge*, looked at private-public strategies to develop the UK's fledgling PV business and its constituent parts into a competitive globally industry. Another was *Electricity from Sunlight*, IT Power for the Department for International Development. This booklet provided decision-makers in developing countries (government, consular, electricity industry, development agencies etc.) an overview of the possibilities for PV-powered applications in disaster relief, healthecare, education and SHSs as a facilitator of increased health and education outcomes for families.

The European Commission (EC) was also investing in PV – from R&D through to market development and deployment. Principally under the guidance of Wolfgang Palz and German politician Hermann Scheer, the EC financed a series of research projects. One was the *PV for the World's Villages* initiative, which analysed financing systems and infrastructure requirements for renewable energy market expansion in developing countries, and issues of supply of SHSs to people in unelectrified areas.

The EC also funded what was and still is the world's largest PV integrated into buildings initiative. Coordinated by myself on behalf of IT Power and relying on the expertise of the University of Northumbria, BP Solar and Ove Arup. *Information Action: Photovoltaics in Buildings* developed a workbook for architects and engineers and conducted workshop around the UK to promote uptake of PV integrated as a building facade. It was also the impetus for another EC-funded project in Argentina. *Photovoltaics in Architecture: Development of a schools' course.*

My life in Solar

By Kim Atkinson

Kim Atkinson started in the Renewable Energy Industry in 1986 when he purchased an established company called Natural Technology Systems (NTS) based in Prospect South Australia. His previous profession as an Electrical & Refrigeration & Electronics Mechanic with extensive experience with AC and DC equipment put him in the right place at the Right Time.

"I answered a small ad in the local paper for Solar Business for sale expecting it to be a Solar Hot water Company but was surprised when I found out it was a Solar Electricity Company. Our first big step and in hindsight the most critical step was when we attained appointment as BP Solar Distributor for South Australia. Our Association with this company over the next 25 years was the making of NTS a market leader in all facets of the Renewable Energy Industry in Australia including the design and installation of Hybris Solar, Wind, Battery, Diesel Generator Systems.

Our first major contract in 1995 was for SA Government when we installed the first of the Dale Butler /Siemens manufactured Interactive inverter charger combined with 120volt battery system with Solar and Diesel Generator. Australia was at the for front of design of Sine Wave Interactive Inverters starting with Dale Butlers original design manufactured by Siemens which then was manufactured by Power Solutions Australia which then was taken over by Selectronic Australia and became the very Successful SP PRO range of Interactive inverter chargers." says Kim.

The success of this project lead NTS to being awarded a contract to Install 5 of these systems for National Parks NSW in the Sturt National Park, following on from this was contracts to install further systems on Montague Island and Green Cape for the National Parks NSW. Kim has been involved with Technology Support and upgrades on all the National Parks Wild Life power systems in NSW for the last nineteen years.

Other project then followed on for Kim's expertise saw NTS being selected to supply and install a large Hybrid, Solar, Wind, and Micro Hydropower system in the Tumberong district in Brunei in 1996.

In South Australia Natural Technology Systems has completed many projects for the National Parks of South Australia including the Seal Bay Visitor Centre, Innamincka and Dalhousie National Parks Containerised Hybrid Solar Wind Power System Value.

Kim has been involved as a Renewable Technical consultant for the National Parks of South Australia and New South Wales and has filled the same roll with the Department of Administrative Services and the Department of Aboriginal Affairs for the South Australia Government.

He has been instrumental in developing the Grid Connect Power market in SA and was at the for front of developing a roofing framing system before all the modern roof railing kits were introduced to the market.

Kim also designed and Built a Modular Grid Connect Solar Battery Pack approved by the then ETSA in South Australia and installed them in houses in 2000 at the beginning of the Grid Solar Rebate scheme.

Kim and NTS were involved with Federal Government initiative called "Enterprise Connect" where small business were grouped together with like businesses to form a Company to take there expertise to the World Market which resulted in participation in contracts in Brunei and Indonesia.

Kim was a foundation member of the Solar Energy Industry Association of Australia, which developed the current Industry Accreditation and Training standards which evolved into the Business Council for Sustainable Energy and then the Clean Energy Council of Australia.

Kim was involved with SEIA and BCSE and the CEC in helping to organise the Appropriate Technology Retails Association [ATRA] annual conference from 1987 to 2015 when the CEC conference format changed to become ALL Energy Show.

Kim added "In the last 34 years I have seen solar modules go from $20 a watt to 26 cents a watt and the uptake of solar as an energy provider become instrumental in forming a noticeable part of the Energy Mix in Australia."

Windy Wellington Welcomes Wind Power

by Graham White
New Zealand Correspondent

February saw the launch of the New Zealand Wind Energy Association. The event included three wind turbines which were erected in Civic Square during the city's Wind Festival to mark the inauguration of the new association.

The New Zealand Wind Energy Association is an alliance of wind power consultants, landscape and planning consultants, potential New Zealand wind turbine manufacturers, local wind turbine agents and electricity generation companies with an interest in wind power.

Its aim is to promote the use of New Zealand's abundant wind resource to provide a reliable, sustainable and clean source of energy for the future. The association plans to educate; inform and influence decision-makers; to raise the profile of wind energy; and to encourage research and development.

The association is promoting the advantages of wind energy for New Zealand which are:

- it produces zero emissions
- it is renewable, abundant and an indigenous energy source
- its environmental impact is very low
- it will prolong the availability of natural gas
- it complements our existing hydro generation capacity as lake water can be saved and stored while the wind is blowing taking the pressure off our hydro system
- it offers flexibility and security of supply
- wind farms can be developed incrementally as power demand grows, with short lead times and relatively small investments
- it is competitive with other forms of new generation
- it would create many manufacturing and construction jobs in New Zealand
- it will help New Zealand meet its international obligations on CO_2 reduction

The establishment of the NZWEA is actively supported by nine corporations already involved in wind power operations in New Zealand. They are: Garrad Hassan Pacific, Wind Torque, The Project Company, Merrill International, Link Technology International, TransAlta, ECNZ, Royds Consulting and DesignPower.

The Minister of Energy, the Hon Max Bradford, was the guest of honour at the launch and commended the members for setting up the association. When asked about the need to account for environmental effects of energy production, Mr Bradford said that a carbon tax was not an option that was being considered by the government.

For the immediate future it is doubtful that any government initiatives will encourage investment in wind energy. All energy projects are now assessed on a purely commercial basis with little consideration of environmental, social or national strategic implications.

Renewables help answer the Greenhouse Challenge

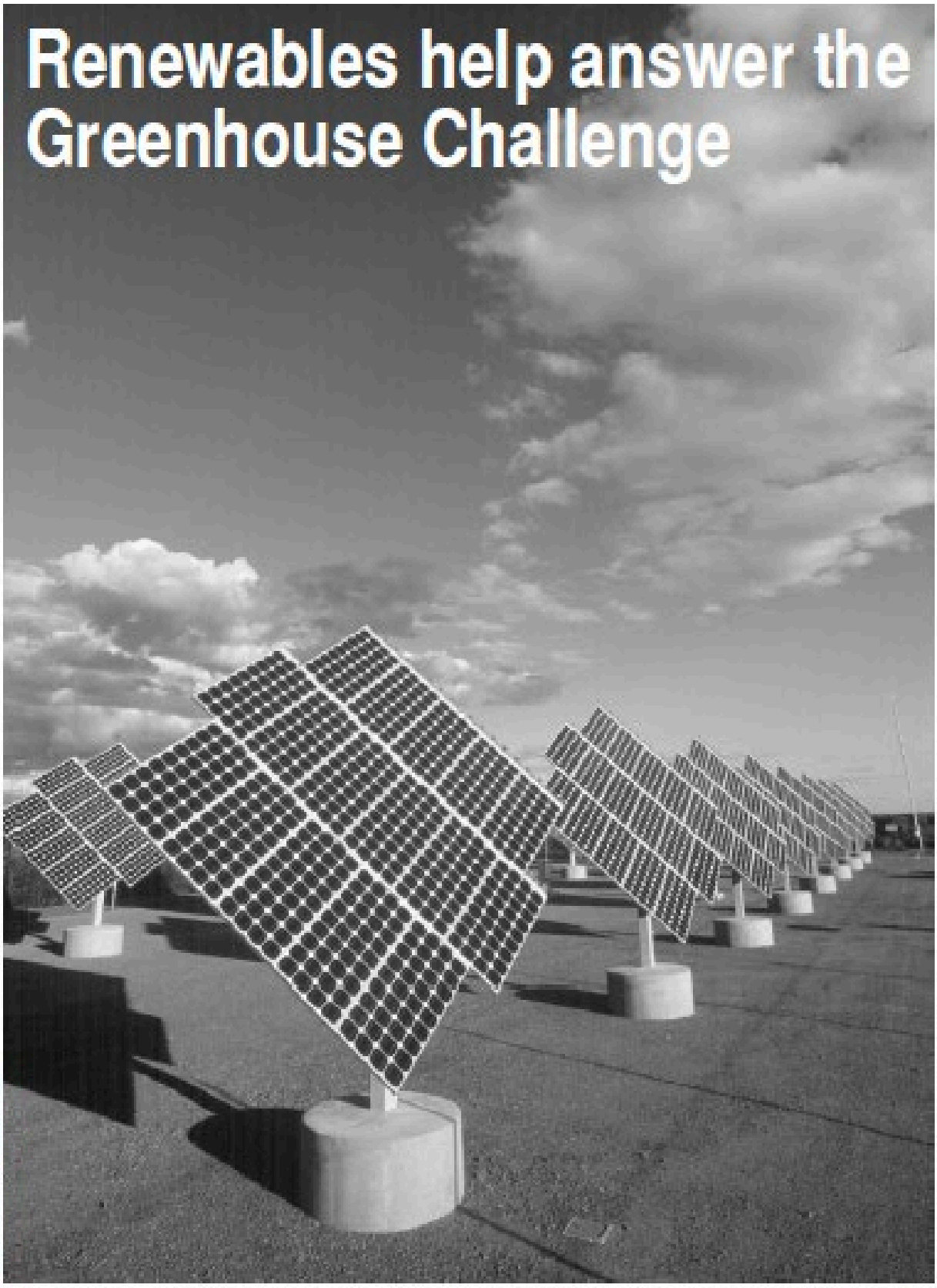

Photo courtesy Western Power

Trevor Lee speaking about ANZSES/AusSES and Solar Progress

2022

Craig Hunter, Peter Bulanyi, Tony Egan, Diana Pook

Lindsay Hart, Trevor Lee, Geoff Stapleton and Iain MacGill

Stefan Jarnason , Liz Harley and Peter Erling

Stuart Watson and Johann Fleur

Early Grid Connected Solar Home

by Rick Potter,

Battery based solar systems remote from the power grid, water pumping systems and recreational caravans made up much of the solar business in 1997.

Solar Charge in Melbourne was approached at this time by one of its existing off-grid customers, Delano Reiss, to design and install a grid connected solar power system on his soon to be constructed house in Brighton East. This style of system was very new to Australia with only one other Victorian system in West Brunswick, installed by Brunswick Electricity (now Citipower) on a private residence the previous year.

Del was a bit of an entrepreneur and he and I spent the next 9 months convincing his power company and distributor United Energy to not only approved the system, but to fund half of it as well. The system comprised 18 x Solarex 77 Watt polycrystalline panels and a CSA sine wave 2.5kW inverter. Installed cost was high at $14 per watt.

Quick and easy mounting systems and 'plug and play' wiring with MC4 connectors were a thing of the future. The builder was required to put support brackets through the tiles prior to us lifting and securing 6 panels at a time, pre-arrayed with the knockout junction boxes pre-wired with conduit. United Energy were there at all stages of the installation to check that all was according to their requirements. The system was then remotely monitored for years back at the United Energy offices in Moorabbin. The installation and commissioning took a full 2 days. For the next few years, a small but determined number of customers installed solar grid connected systems, despite the $14 per watt cost.

Now, 24 years later, over 3 million home systems have been installed in Australia at a cost closer to $1 per watt. How things have changed!

CSG Solar 1997

By Stefan Jarnason

In 1997 we were working a revolutionary thin film Crystalline Silicon on Glass. It was going to revolutionise PV with a 10% efficiency (equal to that of commercially available c-Si) but a price point below USD$1.50/W.

The thing we all missed was not how hard this would be for a new technology to achieve (we knew it would be hard), but that c-Si would experience such incredible efficiency gains and cost reductions, massively shifting the goal posts to make them achievable for our new thin film.

The big lesson for me was that economies of scale are hard to beat.

LATRONICS®

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Heads Up. Radical News.

Something unprecedented in our industry is in store for our company. It's exciting. At midnight on the 30th of June 2025, Latronics will release into the public domain all of the design details and intellectual property (IP) behind our entire range of off-grid LS Series solar inverters. Yes, that's right, we're giving away our 'crown jewels'.

LATRONICS STAND ALONE INVERTER (LS SERIES 500W - 7000W)

Register your interest in receiving news about the release of Latronics LS Series design IP

As a result, from the 1st of July 2025, any individual, organization or business will be able to use our IP to make one of our off-grid inverters themselves (providing they have the right skills, equipment, materials and qualifications, of course). At the same time, we will cease production of Latronics' LS Series inverters and AC Transfer Switches to focus on our growing passion for recycling. (See below.)

Introducing Latronics' Pre-Loved Inverter Sell-Back-To-Us Option

Few electrical products are as robust, reliable and long-lasting as a Latronics LS Series stand-alone inverter. Even so, no electrical product lasts forever. That's why Latronics LS Series inverters are designed with sustainability in mind. The aluminium casing and copper wiring are fully recyclable, for example. Many other components have productive second-lives ahead of them, given a chance.

Our passion for recycling is so strong that from July 2025, when we cease LS Series manufacturing, our business will be transformed into a non-for-profit electronics recycling specialist based in regional Queensland.

REDUCE
REUSE
RECYCLE

The primary mission of Latronics 2.0 - as we have come to think of it - will be to recycle pre-loved Latronics inverters and related products as they retire from decades of service.

We're so serious about this we've already launched a pre-loved Latronics Inverter Sell-Back-To-Us option for LS and PV series owners.

www.latronics.com.au

1997

By Julio Bragagnolo

My experience of Sydney in 1997 was a productive period of growth and retraining in my career. At Pacific Solar we were involved in the design a 20 MW Crystalline Silicon on Glass [CSG] manufacturing plant. Infrequent for that time, the work included both, the development of a complete process and an estimate of the product cost. The cost estimate was pioneering work, not systematically attempted in the US until the first decade of the next century: we acquired and applied the costing tools used in the semiconductor industry to the Pacific Solar SCG photovoltaic plant and developed two plant designs with different cost and technology risk levels. The work was initially focused on capital equipment and then expanded to include full factory costing. Pacific Solar would soon pioneer another significant initiative: Plug&Power, developed in 1999, was a branded residential PV system using a company-developed microinverter. The product was an early contribution to what has become the monumental Australian record of residential PV installations as well as a good product training in the careers of many Pacific Solar alumni. My concern for omitting names stops me from being specific, but… Pacific Solar alumni: this is in your memory. Finally, my thoughts and thanks go to my wife Jenni, who made a great experience of mi life in Sydney.

Jeremy Chu, Mark Burns, Julio Bragagnolo, Kathleen Ryan, Claude Naoum

Michael Harris speaking about start of ATA and Soft Options in 1980

Quirks and Anomalies

By Gavin Street

Sy Hai is a small Hmong commune in Northern Vietnam, close to the boarder with China. The mountains rise almost vertically out of the valleys like in one of those Chinese paintings.

I was a young project manager/engineer overseeing the install and commissioning of a PV system that powered the community hall, health clinic and vaccine fridge as well as the local school (via 150m of overhead cable).

As a pilot project for a much larger rollout, a presentation had been planned in front of executives and television/newspaper reporters - the likes of which had never been seen in this commune before. And all running off the brand-new PV system.

It had been a hectic few weeks - the gravel for the concrete was broken down by hand, and water was carried in by hand from several kilometers away. But we made it and had been testing the system successfully for a couple of days.

But then, about an hour before everyone arrived, the system shut down. I frantically checked everything, and it all seemed fine. Sure, the weather hadn't been great, and the battery state of charge was a little below where I would have liked, but that shouldn't have caused an issue.

I had an (incredibly expensive) satellite phone that I called back to Australia on, and luckily the senior engineer picked up. After talking it through, he also didn't know what it could be. He then called the inverter manufacturer, who luckily was quickly able to identify the problem. "What's the generator mode?"
"There's no generator connected," we responded.
"Doesn't matter, switch it over anyway".
I did and the system kicked back into life immediately.
I stepped out of the inverter room to see 10 government cars driving down the hill...

While the industry has vastly changed since those times, it is still the quirks and anomalies that continue to trip up even those that have been in our industry for a very long time. Will this ever change?

John Patel, Renate Egan, Gavin Street and Rod Seares

Klaus Langner announcing that Latronics is ceasing production in 2025

My Start in the Industry

By Michael Valantine

My involvement in the renewable and solar industry started in the early nineties while I was working as a teacher at Meadowbank TAFE in Sydney. My interest in solar led me into looking to design renewable and solar subjects and courses to fit into the electrical, electronics and engineering streams of the TAFE courses I was teaching. This created a great deal of interest with the students and staff and led us to build a solar car to compete in the 1993 World Solar Challenge. It wasn't anything fancy, a 3-wheel cigar shaped body with 2 wheels at the front and one driving wheel from the rear. The solar array was mounted above being (6 x 2m) on adjustable poles to follow the angle of the sun. It had a top speed of 70Kph and averaged 23Kph on the World Solar Challenge. No world beater as at the time the leading car the Honda Beale averaged 90Kph. Our car cost $45k plus donated parts and support, I believe the winning car cost several Million.

In 1995 I moved to Muswellbrook TAFE as Head Teacher of Electrotechnology and continued to push TAFE and the faculty to run courses in Solar and Renewable Energy developing many courses over the years.

In 1996 I started a part time business mainly due to people coming to me, building and repairing PV Off Grid stand-alone systems as there was demand from the public but very little to no expertise. This led later to registering MV Solar as a full-time business in 2010.

Michael Valantine in middle of photo talking to others from North Coast/Northern Tablelands

Michael Valantine, Rick Potter and Ron Tito in Group Photo

Ric Brazzale talking with Sylvia Tulloch

Crowd watching speaker

Geoff Stapleton talking with Ken Scott. Nick Wardrop and Ernest Gavey watching speaker

Lindsay Hart interviewing Johann Fleury

The evening finished with Lindsay interviewing Johann to gain his perspective on the evening-in summary he found it fascinating on what had been achieved back in the 1980's and 1990's by the industry in its early days.

Remembrance

Unfortunately, there have been several people, who have passed away, who contributed greatly to the solar industry either through research and development, in the industry and/or in the media. At both solar pioneers' nights those who have passed away were remembered. However, it is appreciated that the following list would not be conclusive and there would be others that were overlooked, and we apologise to any friend or relative of those who have passed away and not listed below. In particular, since the Australia section of the International Solar Energy Society (ISES) was formed in 1962 there would have been many people that were involved with that organisation for many years who have passed away. Three that come to mind immediately are:

- **Roger Morse**- CSIRO- He attended the Association for Applied Solar Energy (AFASE) conference in 1955. In 1964, when AFASE became the Solar Energy Society he became a Board Member. He was the first Chair of the first section of the society, the Australian- New Zealand section, formed in 1962. He was Chair of the ISES Solar World Congress in Melbourne in 1970. (Note the solar energy society became the International Solar Energy Society in 1970)
- **Frank Hogg**- was secretary/treasurer of ISES from 1970-1985 and first secretary/treasurer of the ANZ section of the Solar Energy Society and active in the ISES headquarters when it was moved to Australia in 1970.
- **Wal Read**- CSIRO- ISES President 1983-1985, ISES Secretary/Treasurer 1985-1995 and was actively involved at the ISES headquarters for the 25 years it was in Melbourne (1970-1995)

Solar Pioneers Night 2017

During this night the following were remembered:

- **Tony Stephenson** - Survival Technologies
- **Gavin Wright** -
- **Ross Horman** – Victorian Installer and teacher
- **Derek Bird**- Solarex and Sharp
- **Dr Bill Parker-** Editor of Solar Progress
- **Steve Benko**
- **Mark Scupham**
- **Steve Mundy:** Pyramid Solar
- **Dale Butler-** Butler Inverters, Siemens
- **Bill Charters** - Chairman of the Victorian Solar Energy Council ~1990, ISES president. ANZSES
- **Stuart Watkinson** -Founder of AERL and developer of MPPT.

Solar Pioneers Night 2022

During this night the following were remembered:

- **Richard Collins**: BP Solar, Private consultant and GSES
- **Jeff Hoy**: JP Energy
- **Stuart Wenham**: UNSW
- **John Ballinger**: UNSW (Architecture)
- **Govind Kant**: Trina, RFI
- **John Hall**- Solar Sales


2017


2022