



Yuhao Luo, co-founder & CTO (LEFT), Zhi-Min Ling co-founder & Chairman (RIGHT)

When uncertain times defy innovation, new opportunities shine brightly for the future

This year marks APsystems' 10th anniversary. While the situation worldwide is facing unexpected challenges on many fronts during this very particular year 2020 with the Coronavirus pandemic, Dr Zhi Min Ling, co-founder and chairman of APsystems, shares his views on his entrepreneurial story with Maxime Boiron, Senior Director of Marketing EMEA & Australia, also at APsystems.

From its very beginning, when the economic effects of the 2008 financial crisis were still strongly present, to where APsystems is today, having become the No.1 multi-module microinverter supplier in the world. It is as if challenging uncertainty could also be a key in

building long-lasting opportunities.

Maxime Boiron: 2020 is the year of APsystems celebrating its 1st decade, how does it make you feel?

Zhi Min Ling: Fortunate, honored and

grateful. It is a major milestone for the company, especially in this very fast-changing inverter industry which is at the crossroads of high-tech microelectronics, energy and environmentally-friendly building sectors. Staying alive is one thing, but growing



Maxime Boiron

Dr Yuaho Luo, my colleague, also co-founder of APsystems, who is also our CTO sharing his time between Cupertino, California and our headquarters in Jiaxing, and myself acquired extensive technical knowledge in the Silicon Valley, where we worked for several decades in High Tech companies such as AMD, Xilinx or Solaria Corporation.

Xilinx is the inventor of Field-Programmable Gate Array (FPGA) circuit design, a semiconductor design approach allowing programmable firmware to be used for product upgrades and customization. This is the hardware technology we have been using in all the microinverters we manufacture. We decided to take that path in technology mainly for future-proof flexibility and the cost-savings advantages it brings to customers over other options. It was also a phase when we had to build all departments of the company, acquiring the right leadership team from R&D to manufacturing and building the appropriate investment ecosystems to allow us to drive our ambitions forward.

Within about two years, we managed to design, manufacture and launch our 1st single and duo microinverter products with the YC250 and YC500 which later became the best-selling duo microinverter worldwide. We set up our headquarters in Jiaxing, China, where we still manufacture our products thanks to the help of the TDG group, our main shareholder and share our R&D department between Jiaxing and Cupertino.

Then the 2nd phase was characterized by one obsession: how to make APsystems Grow Internationally with no compromise to profitability. Although we are still in this phase with constant profitability every year since 2012, I would say that over the past six years (2013-2019), and especially since Olivier Jacques joined the company in 2015, we have managed to structure ourselves by Business Units on all continents enabling us to serve our customers in more than 80 countries today.

We started this period by rebranding the company from APS to APsystems, providing a clear mission statement vision, values and working principles to all employees. It continued with the creation of subsidiaries in Australia, United States, Netherlands, France and recently Mexico. Of course, this international expansion has required strong investments in experienced local sales, services and marketing teams but has also demanded a strong leadership to accelerate the company's footprint in a sustainable way.

Olivier Jacques, who is now President and Global Executive VP, in charge of all BU development and profitability, has been instrumental in this ongoing journey. It was also a period which enabled us to prove our innovation capabilities in the long run, constantly pushing forward the boundaries of our creativity. In 2014 we invented the 1st native 3-phase microinverters adapted to

larger solar projects and to make it even more attractive, we developed this microinverter as a QUAD, i.e. connecting four PV panels per unit. The YC1000 was progressively launched across the world in 2015 and 2016 with great success, demonstrating that Quad Microinverters were not only possible to manufacture but they also had a real place in the market for 3-phase installations.

Being able to successfully launch multi-module microinverters in various parts of the world was a great achievement, something no one else had done before so I am quite proud of our team for this. Besides, the innovation journey has continued since, with a fully ZigBee-integrated single-phase microinverter range providing robust communication capabilities, launched over the past two years with our YC600 duo and QS1 quad.

MB: What were the main challenges along the way?

ZML: It is quite fascinating to be able to be part of this solar revolution. Helping to make solar an affordable clean energy solution to everyone on this earth is inspiring but of course, the technological challenges are big. If you take communications for example, microinverters manage a considerable number of data points that need to be communicated back from the microinverters through the gateway and to the monitoring platform in the cloud. This means when systems like the YC1000, QS1 and YC600 apply remote firmware upgrades, this creates a demanding bidirectional data flow and traditional powerline communication isn't going to cut it.

This is the reason we moved our portfolio to high-speed wireless Zigbee, which is up to three times faster than conventional powerline communication (PLC), creating a local 2.4GHz mesh network for fast and reliable data communication between the microinverters and the gateway. We also had to resize our server infrastructure on the cloud to be able to manage 100 000 installations online sending back and forth a steady stream of data today and probably 10 times more tomorrow.

Another constant challenge has been to adapt to increasingly complex market needs. The progressive integration of PV into the electricity networks has stimulated manufacturers in many countries to release products capable of interacting in real-time with grid operators. Whether it is to adjust the PV production instantaneously, depending on the state of the network, or to prevent any electron from being sent back, performing such a functionality for the coming 20 years in a reliable manner with a product smaller than an A4 sheet and weighing 3kg average is a genuine achievement in technological integration, entailing very sophisticated R&D, manufacturing and testing capabilities.

profitably when you need to heavily invest in R&D on one side, while keeping enough agility to adapt to an ever-changing emerging market on the other side, is another challenge.

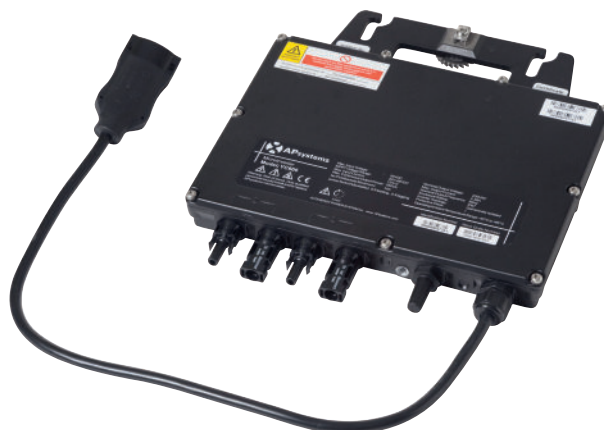
The fact that we have been growing for 10 years while reaching profitability every year since 2012, is primarily down to the hard work, determination and patience of the hundreds of talented and committed people who have joined and believed in this company over the years.

MB: What encouraged you to set up APsystems? And how has the company evolved over the years?

ZML: The company has changed dramatically for sure. We can look at the company's development in two phases, I think. The foundation 2010–2012: it was the very beginning where every priority was focused on setting up our expertise in power electronics conversion designs to create a robust and cost-efficient microinverter solution.



QS1 HD with AC cable



YC600 HD with AC cable

We are one of the only microinverter companies worldwide which has its Reactive Power Control (RPC) microinverter range ready, which means compliant to be installed almost everywhere in Europe including in Germany, but also in Australia, or California for example.

MB: How is the pandemic situation affecting your activity?

ZML: When COVID-19 first appeared in China at the beginning of the year, our activities were relatively spared since part of our production comes from outside China, even though a slowdown in manufacturing occurred during a period of about 1 month in the first quarter.

The good news is that as we mastered the production infrastructure, we were able to quickly increase our production rate when the situation improved a few weeks later, ensuring a constant continuity of supply to all our customers and warehouse locations across the world. Then all continents were impacted one after the other by the sanitary situation: Europe, The United States, Australia, Latin

America etc. This situation put our entire organization in front of an unprecedented collaboration challenge.

Fortunately, organizations of our kind have been leveraging digital working practices for a long time. This has helped in keeping our team committed and close to our customers in this difficult period. Whereas priority has of course been given to every possible measure to ensure the health of all our employees, we have for example successfully run several webinar series all over the world to support our customers and keep them well informed and trained on our solutions. We have provided masks on a large scale to our employees and customers and encouraged our workforce to work from home by all means.

Despite the inherent agility of our distributor partners and solar installers staying open and continuing their job as far as possible, we have inevitably been confronted by a slowdown in our sales activity worldwide this quarter. Uncertainty is the most difficult parameter to deal with when it lasts, it is the same for

everyone as an individual but it is also a genuine opportunity to confront and challenge ourselves by overtaking obstacles with self-confidence. I strongly believe that the creativity and flexibility of our industry will rapidly lead to recovery during the 2nd half of this year.

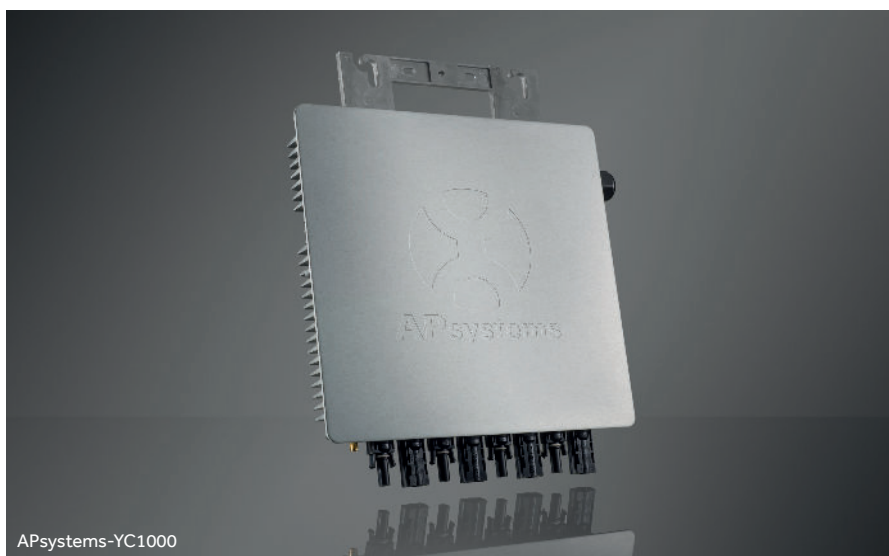
MB: What's next for APsystems?

ZML: APsystems is now well recognized for its leadership in multi-module microinverters solutions bringing innovative products to market that are built to last. This is the DNA of the company and will continue to be. We have several new microinverter products planned to be launched in the coming 18 months including a new native 3-phase QUAD microinverter at the end of this year, but our ambition moving forward is also to increase our position in other Module Level Power Electronics.

Recently we launched, primarily in the United States, APsmart, a new Business Unit that includes advanced safety products such as a Module Level Rapid Shut-Down (MLRSD) device to meet new safety regulations on MW-scale solar projects. The APsmart MLRSD System is a SunSpec Alliance Certified device which maintains constant communication between the RSD and Transmitter, constantly monitoring voltage and current. APsmart offers state-of-the-art PV module rapid shutdown devices (RSD), ideal for any new or existing string or central inverter system, and meeting U.S. NEC 2017 690.12 Rapid Shutdown requirements.

APsystems is also working on a modular AC coupled Energy Storage System (ESS) for residential where priority, similarly to every product we manufacture, is given to high quality and reliability.

We have had an exciting first 10 years and are very much looking forward to the next 10!



APsystems-YC1000