

Version 1 - Speech notes

Conference: Virtual Power Plants, New Energy & Storage & Renewable Energy 2019

Date: 14-15 November 2019

Topic: Case Study – The Zero Emissions Byron project

NSW's first bioenergy plant. A 5MW solar farm for their own use. A shared community-owned solar farm. A hydro scheme. They are working alongside others to develop a microgrid in their arts and industrial estate. All of these projects have lessons to share and insights from others to add.

Time: 30mins, including questions (5 mins)

Speech. N.B- severe time constraints meant that a significant amount of this text was condensed and ad'liibed during the presentation.



I was in New York visiting family this year and my two young daughters were enjoying times square when they became somewhat perplexed as looked up at the night sky and couldn't see any stars. They couldn't believe it when their Aunt told them stars are never seen in New York-they couldn't even fathom the concept.

For two kids from regional NSW who normally look up to the sky at night and see the Milky Way in all



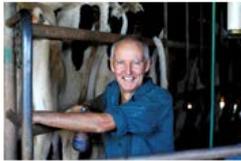
of its glory and magnificence it was a notion that got me thinking about the night sky, its importance to the environment – insects, animals, birds and to us.

It prompted me to put forward a Notice of Motion at a recent Council meeting to look at options whereby we might be able to turn off our residential street lights, where we wouldn't compromise safety, and inturn, turn on positive benefits for our environment through reduced emissions and nocturnal fauna with improved breeding environments.

Staff are currently gathering information and data on this.

My point is that we need to be continually looking for, and striving for, ways to decrease our footprints. Some might work, others might not – but we all need to be constantly trying and thinking outside the box - being creative - and this is something that Byron Shire Council is good at. We're good at it because our residents demand that we are.

## Who are we?



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So allow me to tell you a little about my patch of Earth. Byron Shire – where is it, who are we and what do we stand for?

Most, if not all of you have heard of Byron Bay. It is both a place and an ideal. I am guessing you know the place as a tourist destination. Byron Bay is a part of the Byron Shire. It is a well loved wonder of beaches and hinterland, located 60 kilometers south of the greater Gold Coast.

It's in the top 10 most visited places in Australia and in the top four visited places in NSW.

The latest tourism statistics show that in 2018/19 we got 2.16 million visitors – a record. More than 1 million of those were day trippers.

## More than 2 million visitors a year



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Now to put some context to those numbers – we have a population of 34,500 people. We only have 15, 772 rateable properties – homes, businesses, farmland - and we have to provide infrastructure to cater for more than 2 million tourists. It's a challenge.

But as I mentioned earlier, Byron Bay is not just a place; it is also an ideal.

The ideal of Byron Bay is that it is where people meet, elevate their spirits, celebrate community and aspire to develop a society that is healthy, sustainable, creative, connected and innovative. This ideal has existed in Byron Bay from the Dreamtime to modern time. Our community is passionate, articulate, alternative, idealistic, involved and engaged.

## We are diverse



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We also have conflicting realities. Byron has high rates of social disadvantage. The Australian Bureau of Statistics data confirms that our Shire's per capita rates of homelessness are the highest in the region and our numbers of rough sleepers are close

behind the City of Sydney and twice the national average and yet, we have some of the most expensive real estate in the country.

Byron Shire is every changing and this does not sit well with some people. Our challenge, as a Council, and as a community, is to strive for 'better'. We haven't in the past, and will not in the future, settle for the status quo.

Byron Shire residents have resisted the more homogenised aspects of globalisation. We continue to successfully resist the main fast food chains, high rise and suburban sprawl housing.

We are one of the highest Greens party voting areas in Australia and we are a community who has never given in and accepted that which has been presented to us.

We don't accept 'sameness' and celebrate visions of a better place and planet, actions to bring them to life and a sense of hope that people and communities can control their own destiny. We don't live in nirvana, but we strive for it.

We are well-known for our determination to find local solutions to big problems....so let's talk about Zero Emissions Byron.

## Net Zero Emissions Strategy for Council Operations



In March 2017 Council resolved to achieve net zero emissions by 2025 in collaboration with Zero Emissions Byron, otherwise known as ZEB.

We also committed to sourcing 100% of our energy through renewable sources in ten years – 2027.

From this was born the Net Zero Emissions Strategy for Council Operations 2025.



I think this is one of the most important documents we, as a Council, have ever

developed.

Climate change is not a figment of our imagination – science is telling us that climate change is having a massive impact on the earth.

Aside from the examples further afield with unprecedented coral bleaching events on the Great Barrier Reef, and recent flooding events in Venice, I have left my home today after clearing the earthly dry foliage around my home over the last few days, to try and ensure my home in subtropical rainforest does not burn from intense bushfires raging in Spring-October and November.

As a community – do we, the residents of Byron Shire wait for NSW and Federal Government action? Do we sit on our hands while we wait for direction? In 2109 our Governments can't even come up with a scheme for a viable recycling industry.

We don't have any choice but to attempt to tackle climate change as best we can on a local level and this is what the Zero Emissions Byron project is all about.

The Net Zero Emissions Strategy for Council Operations 2025 is a huge aspiration that takes in all aspects of our business.

It sets out a pathway. We know where we want to go and this Strategy steps out how we are going to get there. You don't achieve goals without a plan and this is our plan.

It is important to point out here that the Strategy's goals of achieving net zero emissions by 2025 and sourcing 100% of our energy from renewable sources by 2027 are Council's goals...we are the masters of our own destiny. We will obviously work with the community to achieve emissions as a shire where possible but our thinking is that we, Council, need to get our house in order and lead by example.

## TO ZERO TOGETHER

- Net Zero emissions by 2025
- 100% from renewable sources by 2027
- Avoid using energy
- Reduce energy use
- Replace energy sourced from fossil fuels with renewables



Our Strategy has steps to achieve TO ZERO TOGETHER:

1. Identify and measure emissions
2. Stocktake completed emissions reduction and renewable energy projects
3. Research potential new projects and explore implementation plan options
4. Research potential funding opportunities for new projects
5. Develop communication and engagement plans to ensure social licence
6. Monitor and report annually on emissions and emissions reduction measures
7. Review and optimise internal processes and projects



### To Zero Together

This strategy is all about turning a threat – climate change – into an opportunity. An opportunity that will benefit our community, our environment, our economy.

It's built on simple principles:

- Avoiding using energy in the first place
- Reducing energy use where we can
- Replacing energy sourced from fossil fuels with renewables
- Investing in high quality offsets
- Reviewing our processes and projects and seeing what we can do better.

So that the Strategy aligns with national methodology on reporting and monitoring emissions - so we can compare apples with apples – we are using the National Greenhouse Energy Reporting (NGER) methodology which applies three boundaries:

- Scope 1 - Emissions that are owned or controlled by the organisation
- Scope 2 - Emissions from the organisation's use of electricity

- Scope 3 - Emissions that are a consequence of the organisation's activities but are not directly owned or controlled by the organisation.

While we will be gradually incorporating scope 3 into our reporting, our initial focus will be what we can control and that is emissions that are owned or controlled by Council and emissions from our use of electricity.

The aim of the game will be net zero emissions.

So how do we calculate net zero emissions?  $\text{NET ZERO EMISSIONS} = \text{TOTAL EMISSIONS} - \text{EMISSIONS REDUCTIONS} - \text{OFFSETS}$ .

Using data from 2015/16 we have established our emissions baseline which is our total emissions. Over the next four years we will work towards reducing our emissions by developing renewable energy projects. Those emissions remaining, will be offset in order to achieve Australian government carbon neutral certification.

So how are we planning to do this? What sort of projects are we looking at to reduce our emissions?

### Solar carpark - Mullumbimby



Solar projects are obviously part of the solution and like many Councils in Australia, Byron Shire has many solar installations in place and we are planning more.

Recently we opened our first solar roof which was built over a section of our public carpark in Mullumbimby.

The roof, which spans some 40 car spaces, was built at a cost of \$330,000 and is a 99 kilowatt system that generates enough

electricity to offset around 25% of the electricity we use every day in our main offices in Mullumbimby.

What I love about this project is the innovative use of space. The roof is angled deliberately so there are no glare problems for neighbours, and while not 100% waterproof, it does provide shade for the cars parked underneath.

As part of the new solar roof installation we have two fast charging stations for electric cars and these are used regularly. They complement another station at our library in Byron Bay.

We also have solar farms planned at each of our three sewerage treatment plants. These have the capacity to generate approximately 300kW and is located on land that would otherwise be unused.

## Dingo Lane

5 MW  
6.3 hectares



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Our most exciting solar project in the wings is planned for Dingo Lane on land next to our waste and resource recovery centre at Myocum.

We're currently getting the project scoped and ready for tender. It will be a 5 megawatt system. It will cover 6.3 hectares and it will generate enough electricity to power around 1000 households. It will generate enough electricity to

offset most of Council's power usage and also send many hours of power back into the grid.

This is a big project for the Byron Shire and it will deliver immense benefit to our community.

## Brunswick Valley Sustainability Centre



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A community solar garden is one part of our plans for the Brunswick Valley Sustainability Centre – a 112 hectare site owned by Council that includes the Brunswick Valley STP.

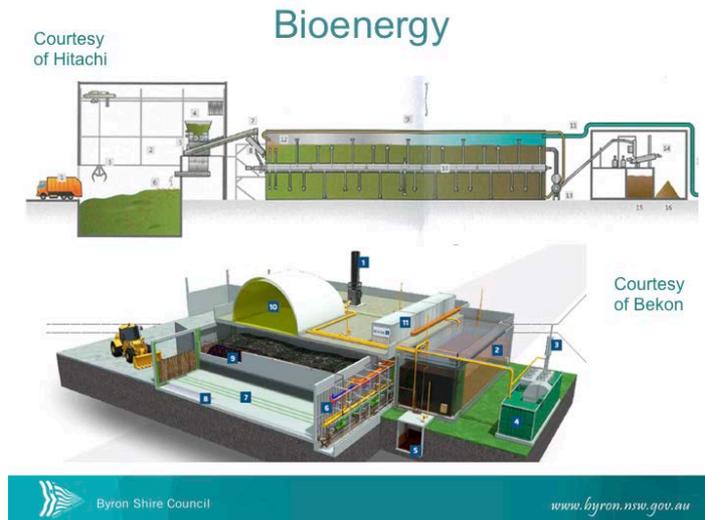
The STP aside, the site is beautiful, taking in 2.4-kilometres of river frontage along the Brunswick River, two large billabongs and a small creek. This area is constantly being regenerated and revegetated with native species.

It's made up of gentle undulating slopes and estuarine flood plains as well as bush and is home to three threatened fauna species including koalas as well as eight threatened flora species.

It's our dream to turn this land, which is largely currently used for cattle grazing, into a sustainability centre that can be used for things like:

- Environmental land use projects – native revegetation, rehabilitation, educational boardwalks and waterways and stabilisation of the Brunswick River bank.
- Affordable housing and community initiatives projects – diverse ranges of housing, education and interpretation centre, community gardens, camping and visitor accommodation.

- STP projects – effluent storage ponds to facilitate effluent reuse, constructed wetlands for effluent polishing, recycled water for irrigation and reuse, a bioenergy facility.
- Biomass cropping to feed a bioenergy facility.



## Bioenergy

And so to our Bioenergy project. It's exceptionally exciting and extremely ambitious for our small council to establish an Australian first, but you don't achieve anything by being ordinary do you?

Our goal is to build a 1.3 megawatt bioenergy plant that can transform biomass waste, into clean and renewable energy, maximise our use of recycled water, generates

electricity to run the STPs at night while reducing our greenhouse gas emissions and finally – produces valuable biochar for soil health.

We are well underway with this project. Early last year we launched international expressions of interest process to gauge the level of appetite from businesses who would be interested in working with Council on this project.

We received 15 submissions, surpassing our expectations. Late last year we sought responses from proponents for a feasibility-level engineering design and estimation of the total installed costs for one turnkey bioenergy facility.

We shortlisted and have begun our feasibility studies with two contractors for dry Anaerobic Digestion ('dry A.D.') organic waste processing facilities converting organic wastes to biogas: Hitachi Zosen Inova Kompogas ('HZI') and the Eggersman Bekon group ('Bekon').

We quickly discovered from the EPA they would only assess our project for approval when we could show comparable living examples of successful operations elsewhere. However, they also acknowledged there were none in the country and they supported our decision to venture internationally to find these comparable best practice examples from which to base our project. Having to show another example before getting support seems counterproductive to innovation-but that is how we know things roll in Australia.

So, a few months ago, Council staff inspected sites at overseas operational bioenergy facilities employing dry A.D. processes. It was essential to conduct site inspections and interviews at operational sites for risk management purposes and to collect detailed reference site data for planning consents and permitting. These facilities utilised the technology developed by either HZI, Bekon, or Renewi Orgaworld. After visiting nine full-scale facilities in Germany, Switzerland, Canada and the USA, we concluded that both the processing technology from Hitachi and Bekon would generally meet Council's objectives for a Byron Shire Bioenergy Facility.

## Bioenergy

Hitachi Zosen Inova Kompogas  
Werdholzli - Zurich



What was discovered was firstly the complimentary ways these plants sat amongst their surroundings, with this one for example surrounded by residential properties with significant shared gardens and the river and its fisheries on the other.

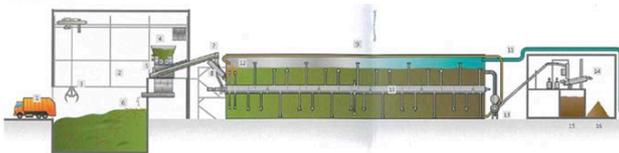


and processing, and is more robust operationally because of its high level of automation;

The HZI PFR process is more flexible with feedstock acceptance

## Bioenergy

Courtesy of Hitachi



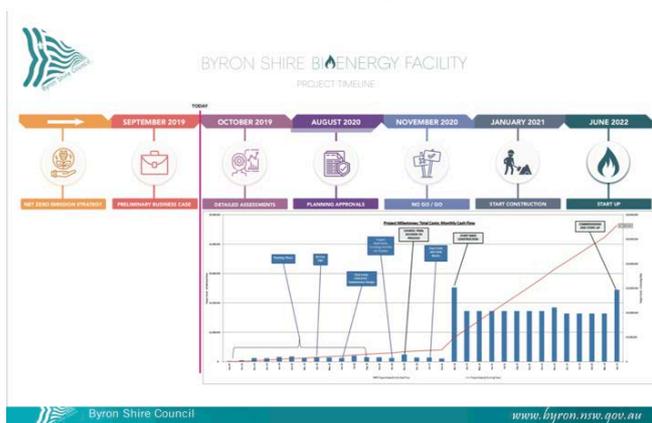
Courtesy of Bekon

however, the HZI PFR comes with a higher CAPEX and also generates considerable volume of liquid digestate that must also be managed. The Bekon batch tunnel process is less costly to build and less complex technologically, but also has a greater need for mobile plant and manual labour requirements. Furthermore, the HZI and Bekon solid digestates are not of the same quality or quantity, and require different handling prior to reuse.



We have now given ourselves the timeframe of making the ultimate decision as to whether

## Bioenergy



two proceed in Nov next year, after we have completed forward work plans on: engineering works; final technology selection; commercial contract models; planning approvals and permits; and, eventually, a Request for Tender ('RFT') for a Design & Construction Operate & Maintain ('D&CO&M') contract.

Over the next 12 months we will also be settling on our Feedstock characterisation; and confirming the required aerobic composting for maturation of A.D. digestate, locking-in feedstock supply contracts and confirming markets for final products

Over the next 12 months we will also be settling on our Feedstock



Securing funding support from ARENA and possibly CEFC through resultant PPA's with energy providers will also ensure the project gets the green light. It is hard to see how it won't fit the funding criteria of ARENA and we remain extremely optimistic in this regard.



Towards Zero – Byron Shire's Integrated Waste & Resource Recovery Strategy 2019-2029 is the document that will set out how we will deal with our waste for the next ten years.

It is currently a draft document that is just about to go on public exhibition.

It is our 10-year plan to transition to a Shire that is carbon neutral by 2025 and sending zero waste to landfill. It's a big aspiration!

Historically in regional areas like the Northern Rivers waste management has been the responsibility of individual councils. As technology advances, the availability of land fills reduces and community demands for environmentally-friendly and sustainable outcomes grow. Councils like Byron are looking for a regional solution.

The cost of investing in cutting edge technology is beyond the reach of small councils like Byron Shire. Additionally, we do not generate enough waste to 'feed' a new processing facility. We need our neighbours and we are working with other Northern Rivers councils and potentially those on the mid-north coast to determine what a regional facility might look like.

We can't do it alone



- Zero Emission Byron (ZEB)
- ENOVA
- Community Owned Renewable Energy Mullumbimby (COREM)



As I mentioned at the start Council's Net Zero Emissions Strategy for Council Operations is Council's blueprint for the future. We can only control what we can control but we are fortunate to be supported and able to work with truly innovative community organisations.

## ZEB – Zero Emissions Byron



Let me introduce Zero Emissions Byron, also known as ZEB.

ZEB was initiated in March 2015 with a meeting between the CEO of Beyond Zero Emissions and myself where we hatched a plan to create ZEB as a prototype for regional and national emissions mitigation in Australia and more locally, to achieve zero emissions in the Byron Shire by 2025.

ZEB's mission is to implement zero emissions strategies to reduce the

impact of climate change and develop new economic opportunities by inspiring and working with the community.

It's focusing on five sectors – energy, building, land use, transport and waste. It's a non-profit company managed by a board of Directors, helped by an expert advisory panel and is the number one community body in our shire that is overseeing the transition to zero emissions. This is separate to Council's goal.

It has also developed a 12-step action plan designed for the community to use to reduce their impact on the planet.

1. Use less grid electricity
2. Install solar panels and batteries
3. Electric vehicles
4. Divest from fossil fuels
5. Plant trees
6. Switch to a local ethical energy supplier
7. Keep an eye out for solar options for renters
8. Get active – join a local group lobbying for action on climate change
9. Get political
10. Talk it up
11. Keep informed
12. Keep positive

ZEB has just launched RePlant Byron – with the plan to plant 1.8 million trees in the Byron Shire by 2025. Last month the first 1,000 were planted with the community coming out in

force to show its support. What a great project with the trees drawing down carbon with the added benefit of an increase in biodiversity and habitat supporting native plants and animals.

ZEB held a very successful EV Forum this year and is already planning the next one. Hundreds of locals turned out to touch, feel and see a wide range of electric vehicles and to hear talks on the benefits of EVs. With more EVs being developed and coming on the market all the time, next year's forum promises to be a great educational event.

Lastly, the ZEB program- 100 Go Solar was a campaign that ran for three and a half years with the goal of getting 100 local businesses to install solar. The goal was achieved in December 2018 with the installations producing 1.5 megawatts of renewable energy.

ZEB is not the only group working in this space.



ENOVA Community Energy is Australia's first community-owned renewable energy retailer. It was born in the Byron Shire in 2016 and is becoming a national success story.

ENOVA is all about people producing and sharing their own electricity and three years since it started at Byron Bay and now have begun the move into Sydney, Newcastle, Wollongong, south east Queensland, South Australia and Victoria.

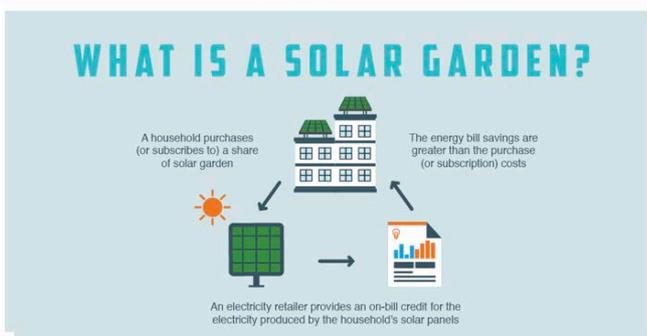


Capital Raise with \$2million now secured.

Recently, Enova completed an additional

Only a month ago, they entered the Newcastle-Sydney-Wollongong Markets, beginning with a waiting list of some 1,900 customers that will add to the already 6,503 customers

## ENOVA



Enova's solar garden project about to be launched. Supported by the Australian Renewable Energy Agency and the NSW Government, ENOVA and ZEB, Byron Shire is one of five places in Australia that have been selected to take part in a feasibility study to see if we are a suitable location for a solar garden.

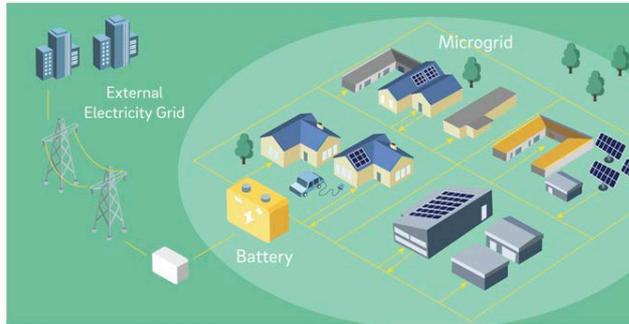


A solar garden is a centralised solar power station that offers people, such as renters,

the opportunity to purchase solar panels with the aim being that electricity generated from those panels are credited on a power bill. It's still a case of watch this space for Enova's first planned solar gardens. But they are at the stage of seeking approvals from Essential Energy on their first property and an announcement is imminent.

## ENOVA

### Byron Arts & Industry Estate Microgrid



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ENOVA, in collaboration with Essential Energy, are planning a microgrid in the Byron Bay Arts and Industry Estate. Basically – people in the A&I Estate will generate energy through renewable energy sources like rooftop solar to power their own buildings and any excess will be available to supply others in the estate who may not have the space or the money to buy their own panels.

Any surplus energy will be stored in a super battery for reuse in the estate or

sold externally. Everyone will remain connected to the Essential Energy grid to guarantee supply. It's will be a two-year pilot.

Enova's Byron Bay Arts & Industrial Estate Microgrid project is well under way with smart metering devices - Wattwatchers data loggers - about to be installed in around 30 local businesses to measure and monitor energy usage. The data will be used to compare to newly designed network and retail tariffs – specifically designed to cater for local renewable energy that costs less because it's stored, shared and distributed locally in the microgrid.

## COREM



- 10 community solar projects by end of 2019
- 500 conversations
- Mullumbimby Hydro
- Switch, reduce, produce – 3 steps to flick fossil fuels from the electricity grid



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COREM is a not-for-profit community group dedicated to setting up community-owned renewable energy projects in the Mullum area.

At the end of this year they will have installed 10 community solar projects in the Northern Rivers with solar panels on buildings including community halls, the Byron Bay High School and the Brunswick Valley Historical Society's museum at Mullumbimby. These projects are producing more than 25,000 kWh of renewable electricity annually

One of COREM's most ambitious projects is to reactivate the Mullumbimby hydro electric power station which was first turned on in 1925. It was decommissioned in 1990.

A pre-feasibility study was completed last year and presently they are working their way through the copious and myriad regulatory processes including legislative changes required.

Council provided COREM with a Community Initiatives grant to train volunteers to talk to 500 Byron Shire residents about reducing energy use and solar electricity.



Saving emissions – one project at a time

Our Net Zero Emissions Strategy puts Byron Shire Council's CO2 production in 2017/18 at 17,453 tonnes. How will we get to net zero in 2025?

The answer is with vision, innovation, commitment, drive, enthusiasm, passion and hard work.

We are confident, that with our projects we can get down to 7,763 CO2 emissions on our own. We will however have to offset the

remainder to reach carbon neutrality.

For a small shire, biased I may be, we are punching well and truly above our weight. There's the projects I have already mentioned but there are many others coming from Council, and the community.

There's our new compost factory at our Resource Recovery Centre that takes roughly 3,000 tonnes of green waste from trees and gardens a year and turns it into high quality compost.

We've got solar powered bikes for our Enforcement team so rather than using cars they are out and about on push bikes.

We have entered into a new electricity contract where 100% of energy is carbon neutral.

We have loads of community gardens in our towns, as well as steam weeding instead of using chemicals.

We've developed a sustainable events toolkit and earlier this year we developed and launched a car share pilot program, the only one in regional Australia, with cars based in Byron Bay and Mullumbimby. For every car share vehicle used, approximately 10 cars are taken off the road.

On the subject of cars – there is a growing number of EV charging stations in the Shire – Council owns three of them...so far.

Like many Councils in Australia we're in the process of changing our street lights to energy-efficient LEDs.

### Solar-powered train



<https://elementsofbyron.com.au/discover-world-first-solar-train-in-byron-bay/>

The world's first solar train began operating in Byron Bay in December 2017.

We are doing a lot in Byron, but there's an army of individuals in the Byron Shire who are quietly making their own mark.

Byron Shire has the head, heart and will along with the expertise, passion and activist energy to first acknowledge the problem of climate change, and then to demand to be a part of the solution and to get to work to make it happen.

**TOZERO  
TOGETHER**



It's not just the residents of the Byron Shire who understand, people around our country understand that the renewable energy conversation has moved from predominantly an environmental imperative to now being an overwhelmingly economic one. Those who move first, adapt first, transition first will also be the first to reap investment, social and employment rewards as well as having a better chance to shape the energy sector to one that meets the community's needs and values.

To close – in the words of E.F. Schumacher: “I can't myself raise the winds that might blow us or this ship into a better world. But I can at least put up the sail so that when the wind comes, I can catch it”.

To Zero Together – it's about Council, community, me and you and it goes beyond the borders of the Byron Shire.



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