



BYRON SHIRE COUNCIL



Byron Shire Low Carbon Strategy 2014

Action on climate change and peak oil

Document History

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Mayoral Address

The Byron Shire is home to a vibrant and engaged community who frequently set the bar high on environmental awareness and action. Our community's expectation to address and plan for the twin threats of climate change and peak oil is evident and this is why it is with great pleasure I introduce the Low Carbon Strategy as our road map for future action. The Low Carbon Strategy is the third edition of the Byron Shire Greenhouse Action Strategy which has been actively implemented for over ten years.

It is through forward planning and our commitment to implementing the past two greenhouse action strategies and the new Low Carbon Strategy that Byron Shire Council will reduce its greenhouse gas emissions and help to reduce our community's contribution to climate change.

Local government is in a unique position to address climate change through its understanding of local issues and our flexibility to adapt to changing conditions. Now more than ever it will be the leadership shown by local government to continue efforts to address the sources of greenhouse gas emissions and prepare for the impacts of both climate change and peak oil.

Both climate change and peak oil are threats whose impacts will emerge gradually over time. This phenomenon creates a false sense of security and has hindered collaborative international action in the past. Release of the 5th Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) 2014 shows that the science is clear and the need to act now is urgent. Through the committed actions of communities such as the Byron Shire throughout the world change and transition will be made a reality.



Simon Richardson
Mayor of Byron Shire

Executive Summary

The Byron Shire like many other economies is heavily reliant on fossil fuel derived products and the burning of fossil fuels for both energy production and transportation. In the midst of concerns over climate change and rising oil prices, a shift towards more sustainable energy sources presents the opportunity to improve the overall sustainability of Byron Shire while creating an economic advantage. The *Byron Shire Low Carbon Strategy* outlines Council's climate change mitigation achievements to date and maps a path for future action on greenhouse gas emission reduction and peak oil preparedness.

The enhanced greenhouse effect and human influenced climate change have dominated global discussion over the past two decades. Australia formalised its participation in an international agreement on climate change by ratifying the Kyoto Protocol in 2007 and committing to reduce the nation's greenhouse gas emissions by 5% based on 1990 levels by 2020. Since 2007 Australia's awareness of the challenges and impacts of climate change has expanded and the emergence of new future challenges such as peak oil has become apparent.

Peak oil is the theoretical date where global oil production begins a pattern of continual decline as oil reserves diminish. This has significant concerns for the cost of an array of activities that rely on petroleum based products such as transport, food, manufacturing, electricity and waste removal.

In recognition of the importance local government plays in addressing climate change Byron Shire Council set a target to reduce greenhouse gas emissions by a minimum of 30% from 2003-2004 levels by 2020. As a member of the Cities for Climate Protection program, Byron Shire Council developed the *Greenhouse Action Strategy 2004* to identify ways to reduce greenhouse gas emissions. Aware of the shared benefit from reducing reliance on fossil fuels, preparations for peak oil have now been incorporated into the third revision of the *Greenhouse Action Strategy Plan* which has been retitled the *Byron Shire Low Carbon Strategy*.

As Byron Shire Council endeavours to shift focus away from fossil fuel dependency a step towards both financial and environmental sustainability is taken as greenhouse gas emissions are lowered and costs from rising fuels prices are avoided. Furthermore the development and growth of sustainable industries to facilitate this change will bring prosperity, resilience and flexibility in the Byron Shire economy.



First Sun Holliday Park solar hot water uses energy from the sun to heat water for the amenities, kitchen and laundry which minimises the need for electricity and hence reduces greenhouse gas emissions.

Background

Climate Change

Climate change is a natural process of long term variations in climate conditions differing from the average conditions of a previous time. It is important to note that while the weather conditions may change frequently between the seasons the term climate change applies to change over decades, centuries or even millions of years. Climate change can occur as either change in weather conditions (temperature, rainfall, etc.) or change in the frequency of weather events (i.e. fewer or more rainfall events)¹.

There are several factors that are known to influence climate change, they are:

- Variations in solar radiation that enters the Earth's atmosphere,
- The Earth's reflective capacity or albedo,
- The greenhouse effect,
- Volcanic and tectonic activity, and
- Biotic activity.

The Greenhouse Effect

The greenhouse effect is a naturally occurring process which enables the Earth's atmosphere to retain heat and is essential in the provision of liveable conditions on our planet. The strength of the greenhouse effect is dependant on the amount of greenhouse gases in the atmosphere, where higher volumes of greenhouse gases increase global heat retention resulting in higher global temperatures (Figure 1). While this process has been in a natural flux for millions of years, the scientific consensus shows that human activities such as the burning of fossil fuels is releasing unprecedented amounts of greenhouse gases into the atmosphere contributing to an accelerating change in global temperature².

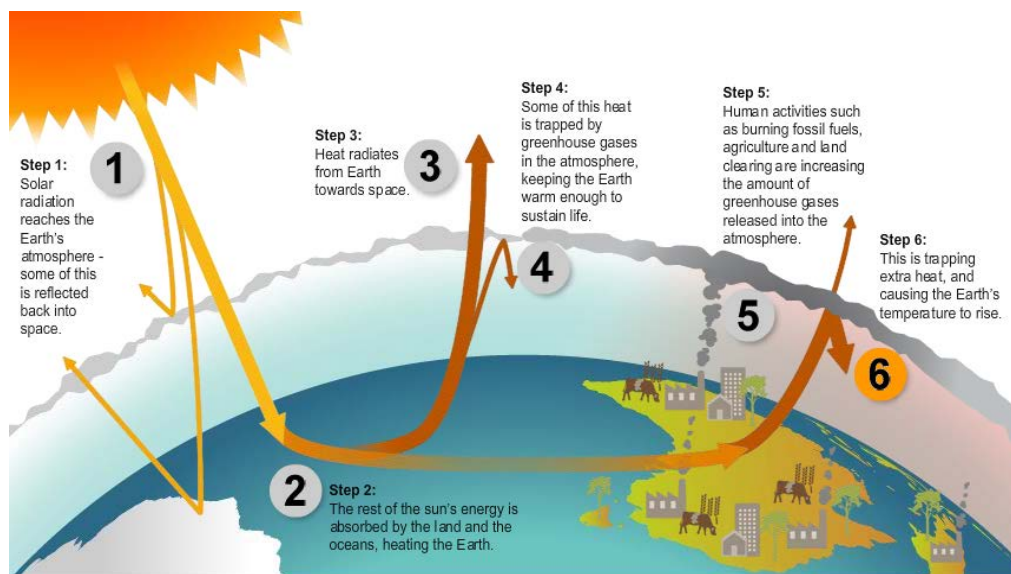


Figure 1: The greenhouse effect (source: climatechange.gov.au)

1. Dessler, A. E. (2012) Introduction to modern climate change, New York: Cambridge University Press

2. Intergovernmental Panel for Climate Change (2007) IPCC Fourth Assessment Report: Climate Change 2007 (AR4) Cambridge: Cambridge University Press

Some of the dominant gasses which influence the greenhouse effect include (IPPC 2007):

- Water Vapour (H₂O)
- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Chlorofluorocarbons

Human Activity and Acceleration of Climate Change

For thousands of years climate change has occurred as a natural cycle where global temperatures have slowly cooled and heated. However, recent human activity such as the burning of fossil fuels, deforestation and land-use change has altered the Earth's reflective capacity and increased the greenhouse effect, thus increasing global temperatures. While these human activities continue to occur the speed at which the temperature is rising is likely to also increase. It is this ever faster rise in global temperature that has raised concerns for the ability of both the biological and built environments to adapt to changing conditions.

The impacts of climate change are complex and interconnected and there is still a lot more to understand. Over the past ten years since this strategy was originally adopted science has been steadily narrowing the gap between to predictions of climate change scenarios and the reality of conditions being witnessed. Current climate models predict Australian temperatures to increase with more extremely hot days and fewer extremely cool days. Some of the potential impacts of increasing global temperatures that have been identified include:

- Increased length of heat waves,
- Increased frequency and severity of storm events,
- Increased frequency and length of drought events,
- Rising sea levels and ocean acidification,
- Loss of habitat, and
- Loss of biodiversity.

Living in a Fossil Fuel Economy

Fossil fuels were created through the decomposition of living organisms hundreds of millions of years ago. The most commonly used fossil fuels include: oil, gas and coal. Today's economy is heavily reliant on the use of fossil fuel products. It is virtually impossible to live a day without interacting with a product that is either made of or has used fossil fuels during its production. This is concerning as fossil fuels are non-renewable resources, meaning reserves are not replenishing at the rate of consumption. The growing demand for fossil fuels, particularly crude oil, coupled with decreasing supply has created global concern for the day when supply will not be able to meet demand.

Peak Oil

Peak oil is a theoretical point in time at which the global oil production rate climaxes. Following this date a decline in daily oil production will be observed. The true date of 'peak oil' is not accurately known with many different models showing that either peak oil is happening now, is yet to come or has already occurred. As an example Figure 2 shows peak oil production to have occurred in 2002.



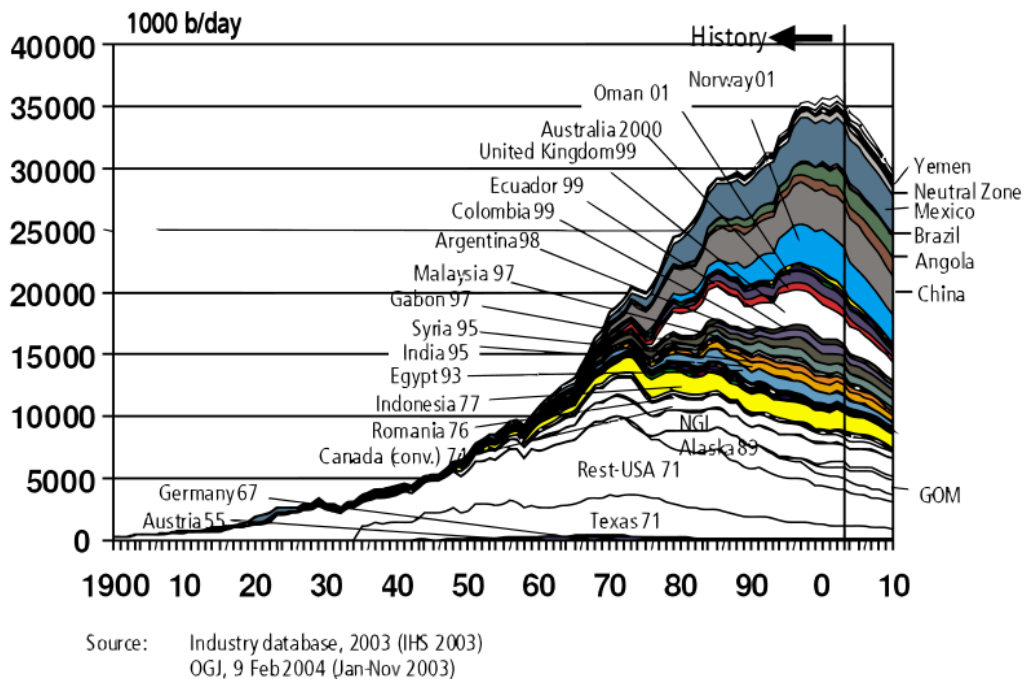


Figure 2: Production curve showing the peak production dates of oil producing countries.

With a peak oil date defined or not, it is highly likely that oil prices will continue to rise as oil stocks continue to decline. This will have an astounding impact on industry in the global economy, significantly raising the cost of production and operation. Furthermore, it is predicted that when global oil supply fails to meet demand, oil dependant industries will need to compete for the remaining stock or cease operations that are reliant on oil. This point in time is known as the 'oil crunch' and planning to avoid the impacts of such an event is essential for a resilient economy and society.

Climate Change and Peak Oil: Drivers for Sustainability

Although Climate change and Peak oil are significant challenges they can also be seen as drivers for change towards more sustainable practices. In this instance a real opportunity has been granted to solve two problems at once. Through lowering the dependence on fossil fuels both greenhouse gas emissions and operating costs can be reduced. In addition, the development of new technologies and products that are less reliant on fossil fuels will foster economic growth and resilience.



Cycle ways encourage the use of active transport modes that reduce greenhouse gas emissions and the community's reliance on fossil fuels.

Climate Change in the Byron Shire

Located on the east coast of Australia Byron Shire is at high risk of experiencing the effects of climate change. Table 1 highlights some of the concerns for the environmental, tourism, residential, commercial and industrial sectors of the Byron Shire.

Table 1. Climate change related impacts for Byron Shire

| Sector | Climate Change Related Impacts |
|--|---|
| Environmental | Loss of biodiversity caused by loss of habitat and species migration |
| | Sedimentation and pollution of waterways caused by flash flooding |
| | Habitat disturbance and damage from increased storm activity |
| Tourism Residential Commercial Industrial | Damage to key infrastructure due to increased storm activity |
| | Increased pressure on water security as a result of increased drought intensity and contamination from flash flooding |
| | Electricity outages as a result of increased storm frequency |
| | Flash flooding (especially in low lying areas) a result of increased storm intensity |
| | Coastal incursion of sea water as a result of sea level rise |
| | Failed data services as a result of increased storm frequency |



Byron Shire resident winners of “Beat your power bills competition” saved the most on their electricity bills by implementing a suite of easy changes in the home.

Peak Oil and the Byron Shire

Peak oil and the associated rise in oil prices have already and will continue to have an influence on the costs of numerous activities. Table 2 below lists examples of how rising oil costs will affect activities provided by Council.

Table 2. Potential areas of impact from rising oil prices

| Activity | Impact |
|--|---|
| Road Surfacing and Maintenance | Construction and maintenance of asphalt (tarmac) will increase |
| Engineering Operations | Construction materials and transportation will have a higher cost |
| Maintenance of Parks and Reserves | Increased cost of mowing, and higher cost of fertilisers |
| Waste Removal | Higher costs of fuel for waste services |
| Wastewater Treatment | Higher energy costs with wastewater treatment |
| Water Supply | Higher energy costs associated with pumping and water treatment |
| Security and Council Rangers | Higher costs of fuel |
| Street and General Lighting | Higher energy costs |
| Air Conditioning of Buildings | Higher energy costs |
| Rate Collection | Financial stress related to increased cost of living may limit the ability for rate payers to pay rates |
| Health Care | Higher costs to travel to health centres |
| Transport | Higher fuel prices and lack of public transport alternatives |
| Tourism | Higher fuel prices, resulting in a deterrence for international/domestic travellers |



Community gardens foster community relationships, increase food security, share food growing knowledge and reduce the distance food needs to travel to the consumer. This all leads to fewer greenhouse gas emissions and a more resilient community.

Byron Shire Low Carbon Strategy Aim & Target

The aim of the Byron Shire Low Carbon Strategy is to:

Mitigate climate change through reducing Byron Shire's greenhouse gas emissions whilst improving the resilience of Council and the community for future scenarios such as peak oil.

Byron Shire Council made a commitment to reduce greenhouse gas emissions by setting a target of 30% reduction from the 2003-2004 levels by 2020. The greenhouse gas emission reduction target allows Council to set a clear direction and actively pursue projects to contribute to meeting emissions reduction. To achieve the emissions reduction target Byron Shire Council has engaged a resource benchmarking company (Planet Footprint) to actively monitor greenhouse gas emissions from general electricity use, street lighting, heavy and light vehicle fleets and landfill. From the information collected Byron Shire Council produces an annual status report for greenhouse gas emissions which monitors the progress towards meeting the greenhouse gas emissions reduction target. Through the monitoring of greenhouse gas emissions Council has tracked a disturbing upward trend of emissions from council operations. This has been largely due the growth of new facilities such as new sewage treatment plants and community facilities such as the Byron Regional Sports Complex and Byron Bay Library. Now more than ever Council is committed to reducing its greenhouse gas emissions to turn the corner and start a trajectory down towards the adopted target.

In addition to the emissions reduction target the Byron Shire Community in conjunction with Council set a 10 year vision for the Byron Shire area. As part of the *Byron Shire Council Community Strategic Plan 2022*, Byron Shire Council has shown its commitment to creating a low carbon community, as shown in Community Outcome EN3 (Table 3).

Table 3. Excerpt from the Byron Shire Council Community Strategic Plan

| | |
|---|--|
| <p>EN3</p> <p>A low carbon community that integrates:</p> <ul style="list-style-type: none"> a) food security b) renewable energy c) climate change d) non-renewable resource constraints, including peak oil and e) economic and social prosperity and resilience. | <p>EN3.1 Implement initiatives that address climate change.</p> <p>EN3.2 Promote water and waste minimisation – avoid, reduce and reuse waste.</p> <p>EN3.3 Encourage low consumption lifestyles and environmentally aware practices.</p> <p>EN3.4 Implement initiatives to prepare Council assets for climate change and peak oil impacts.</p> <p>EN3.5 Promote reduced energy consumption, increased energy efficiency and the local provision of renewable energy.</p> <p>EN3.6 Support initiatives that enhance socio-economic prosperity and resilience at the local level.</p> |
|---|--|



Byron Shire Greenhouse Action Strategy 2008

Completed Actions from 2008 to 2014

The following section outlines the actions completed from the *Byron Shire Greenhouse Action Strategy 2008*. Actions not completed from the 2008 Greenhouse Action Strategy have been updated and included in the new 2014 Low Carbon Strategy.

Table 4. Completed actions from the Byron Shire Greenhouse Action Strategy 2008

| Action | 2013 Status | Responsibility | Outcome |
|---|--|----------------------------------|---|
| Modify tendering and contract procedures to require double sided submission of all Council tenders and contracts from applicants. | Alternative Action Taken Complete | Corporate and Community Services | The use of tenderlink has superseded this action to electronic submissions. Other actions for paper reduction can be identified such as agendas and possibly technology developments payroll. The 3 weekly cycle of Council meeting will reduce council's paper use for agenda printing |
| Investigate use of timers for hot water heating in Council administration building. | Complete | Corporate and Community Services | Zip efficient water heaters installed in all kitchenettes (September 2010). Timers run hot water systems from 7am to 4pm and automatically shut off when not in use for more than 2 hours. |
| Design new Byron Bay library to incorporate ESD principles | Complete | Corporate and Community Services | The new Byron Bay Library achieved a 5 Star green building rating and opened in 2013. |
| Establish a community garden in Mullumbimby. | Complete & Expanded | Corporate and Community Services | Both the Mullumbimby Community Garden and the Shara Community Garden have been established. |
| Install solar films in Council Chambers to reduce reliance on air conditioning. | Complete | Corporate and Community Services | Solar films installed on windows in administration building 2009. As part of the renovations happening in July August 2013 solar films installed on the vertical windows of the Council chambers to reduce glare and heat load during summer. |
| Consolidate information technology network servers from 25 to 15 units. | Complete & Expanded | Corporate and Community Services | As of May 2013 a consolidation of Council's current 12 servers were reduced to 7 |



| Action | 2013 Status | Responsibility | Outcome |
|--|---------------------------------|----------------------------------|--|
| Revise Council's Management Plan to maintain sustainability focus | Alternative Action Taken | Corporate and Community Services | The Byron Shire Community Strategic Plan 2022 aligned with sustainability focus. Published 2012 |
| Evaluate tenders for design and construction of Valances Road Sewerage Treatment Plant against greenhouse gas generation | Complete | Infrastructure Services | The Waste Water Treatment facilities have been installed. The decommissioning of sewage treatment plants at Mullumbimby, Brunswick Heads and South Byron and the commissioning and upgrade to sewage treatment plants at Valances Road, West Byron, Bangalow and Ocean Shores is complete. |
| Implement methane gas capture / flaring at Shire landfill | Complete | Infrastructure Services | Council installed a basic landfill gas collection and flaring system to reduce odours and greenhouse emissions in 2010/11. It captures gas from existing vents and destroys odour and methane by combustion in landfill gas flares. Trial flare expanded to the current flare July 2011. |
| Investigate options for recycling of household organic waste | Complete | Infrastructure Services | Organic waste collection due for implementation August 2015. |
| Finalisation of Byron Shire Bike Plan | Complete | Infrastructure Services | The Plan was adopted by Council in August 2010 and the prioritisation of works has been conducted via the section 94 plan. Additional funding is required to access the 50/50 RMS funding opportunities. |
| Review Light Fleet Procedures to integrate with Green Fleet Guide | Complete | Infrastructure Services | The vehicle ratings in the Green Fleet Guide have been used as criteria for selection of vehicles for Council's fleet. This will occur as part of the annual review. |



| Action | 2013 Status | Responsibility | Outcome |
|---|---------------------------------|-------------------------|--|
| Installation of energy efficient lighting at Bangalow Sports Fields | Commenced | Infrastructure Services | Energy efficient lighting has been installed on new projects such as Tom Kendall Oval, Pine Ave No2, Mullumbimby netball and soon Lofts Oval at Brunswick Heads and Jeff Schneider field at Bangalow. Product information suggests that there is a 40% saving in power costs when using these lights over conventional technology. |
| Upgrade street lighting to improve energy efficiency | Complete | Infrastructure Services | A bulk upgrade of streetlights occurred during 2011/12 financial year. Rollout of LED lighting being installed at Main Beach. |
| Install power factor correction (PFC) devices at pumping and sewerage treatment sites in Byron Bay, Ocean Shores and Mullumbimby | Complete | Infrastructure Services | Power factor correction devices have been installed on all electric drives where it has been viable. |
| Install 'jockey pumps' at major sewerage pumping stations to reduce energy usage during low flow periods | Alternative Action Taken | Infrastructure Services | Where applicable, Variable Speed Drives for pumps to operate at lower kilowatts (amps) at lower flows have been installed. |
| Create biosolids management strategy to determine a long term option for disposal of biosolids from sewerage treatment plants that minimizes greenhouse gas emissions | Complete | Infrastructure Services | Biosolids are delivered to a variety of farms for agricultural fertiliser |

| Action | 2013 Status | Responsibility | Outcome |
|--|-----------------|-------------------------------------|--|
| Conduct greenhouse gas emission audit of Council waste operations | Complete | Infrastructure Services | The landfill gas flare was installed in 2011. Council then went onto registered as an accredited carbon offset credit generator in May 2013 for the waste emissions generated at the landfill. Revenue raised from sale of carbon credits was used for operation and expansion of the landfill gas flare system. |
| Install solar films on West Byron Wetlands Interpretive Centre | Complete | Infrastructure Services | Solar films have been installed. |
| Modify position descriptions to require applicants to demonstrate commitment to sustainability principles in recruitment selection criteria | Complete | Organisation Development | Sustainability criteria incorporated into many position descriptions and used for performance planning and review. |
| Reduce reliance on hard copy / paper files in legal services area through transition to electronic media storage and double-sided printing both (internally and through stakeholder lobbying). | Ongoing | Organisation Development | All of Council's panel solicitors are registered E-lodgement users, which enables Council documents to be filed electronically rather than in hardcopy. Council now uses electronic storage media, e.g. CD and memory storage devices, when transferring large volumes of documents to external sources, such as solicitors, reducing paper use. This will continue to be implemented as much as possible. |
| Conduct community incentive Solar Hot Water Heating campaign | Complete | Sustainable Environment and Economy | Byron Shire community solar hot water campaign conducted from April - June 2008, including public presentations and a negotiated additional Byron Shire discount. The campaign resulted in over 100 solar hot water installations. Subsequent Northern Rivers regional solar hot water campaign conducted from Sept. - December 2008. |



| Action | 2013 Status | Responsibility | Outcome |
|---|-----------------|-------------------------------------|--|
| Northern Rivers Food Links Project | Complete | Sustainable Environment and Economy | <p>Regional food project that aims to secure a sustainable food future for the region. Through a number of funding streams, the project sought to mitigate climate change impacts associated with food production and distribution and strengthen community resilience to climate change and peak oil impacts.</p> <p>Projects benefiting the Byron Shire included:</p> <ul style="list-style-type: none"> • Source identification labelling in stores • Sustainable Food Directory • Mullumbimby Community Garden access up grade, signage and harvest festival • Sustain Food Website - linking produces/retailers/consumers • Sustainable Farm Planning • Regional Distribution Project • Northern Rivers Landshare • Farmers Market Network Development • Skilling the Community • Virtual market place linking producers, retailers and consumers • Local Government Resource Kit |
| Create sustainability portal on Council's website | Complete | Sustainable Environment and Economy | <p>Visit: www.byron.nsw.gov.au/sustainability Pages on all Council's sustainability programs and community information, including sustainable living fact sheets and resources, energy and water efficient rebate information and community initiatives.</p> |



| Action | 2013 Status | Responsibility | Outcome |
|--|-------------|-------------------------------------|--|
| Northern Rivers Carpool Scheme | Ongoing | Sustainable Environment and Economy | Website developed by regional alliance of Councils to facilitate on-line carpooling matches. Visit: www.nrcarpool.org . Now over 1700 members and recently released a new app. Five other regions around Australia have taken up a licence to do the same project. Splendour in the grass using Northern Rivers Carpool site to link attendees. |
| Ethical Catering Policy | Ongoing | Sustainable Environment and Economy | Policy outlines Council's food ethics and catering expectations. Adopted June 2010. |
| Byron Shire Climate Change Adaptation Implementation Action Schedule | Complete | Sustainable Environment and Economy | Byron Shire Climate change Adaptation Implementation Action Schedule developed through risk analysis process and adopted by Council on 10 June 2008 (Res. 10-408) |
| Byron Shire Community Gardens Policy | Complete | Sustainable Environment and Economy | Policy developed to support and guide community gardens across Byron Shire. |
| Beat Your Power Bills Energy Efficiency Competition | Complete | Sustainable Environment and Economy | With the aim to save more energy than the previous years winter and spring energy consumption entrants each received an energy saving package full of tools, tips and tricks and were set on their way. The result of this competition was an average consumption reduction of 28% over the winter period and 21% over the spring period. |



Solar panels on the Brunswick Heads Community Centre reduce greenhouse gas emissions by supplementing the centre's energy use with electricity made from the sun.

Byron Shire Low Carbon Strategy 2014

The *Byron Shire Low Carbon Strategy 2014* assists Council and the community to pursue opportunities for a low carbon, less oil-reliant future. It also assists in the development of a resilient, flexible and sustainable environment, society and economy amidst the pressures of rising oil prices and climate change. The *Low Carbon Strategy 2014* was developed through consultation with the Biodiversity and Sustainability Committee and Council's executive management.

The *Byron Shire Low Carbon Strategy 2014* lists proposed projects and has been divided into both topic themes and Council division. Eight topic themes are listed within the *Byron Shire Low Carbon Strategy 2014* they include: carbon, energy efficiency, transport, staff and community engagement, waste, peak oil and water. Each action has been given an identifying number, a unique name and a short description outlining what is to be achieved. Additionally each action has been linked to the *2013-17 Byron Shire Council Delivery Plan* to ensure that projects align with the overall direction of Council's four year plan. Table 5 defines the column headings of the *Low Carbon Strategy 2014*.

Table 5. Legend for the *Byron Shire Low Carbon Strategy 2014*

| | |
|--------------------------------------|--|
| Action ID | Identification number for action |
| Name | Name of the action |
| Description | Brief description of action activity |
| 2013-17 Delivery Plan Linkage | Action linkage with delivery program number from the <i>Byron Shire Council Revised Delivery Program 2013-2017</i> |
| Council Responsibility | Council division responsible for implementing the action |
| Theme | Action sustainability theme |
| Scheduled Year | Year in which the action is planned to be completed |



The Northern Rivers Carpool website matches people travelling to work and study so that may start to carpool together. Carpooling is an excellent social way to reduce fuel usage and greenhouse gas emissions at the same time.



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|--------------------------------------|---|-------------------------------|----------------------------------|-------------------|----------------|
| 1. | Caravan Park Energy Audit | Conduct detailed energy audit of all Council owned caravan parks | 22, 45 | Corporate and Community Services | Energy Efficiency | 1 |
| 2. | Sustainable Investment | Investigate environmentally and financially sustainable investment opportunities as well as the potential for divestment opportunities away from non environmental/ethical activities | 24 | Corporate and Community Services | All | 1 |
| 3. | Solar Energy Contract Implications | Investigate contractual implications of the installations of large scale solar energy projects on Council's electricity contracts | 24, 45 | Corporate and Community Services | Renewable Energy | 2 |
| 4. | Paper Reduction | Investigate ways to minimise paper use in the organisation (eg Digitising Council meeting agenda's and payslips) | 5, 22, 24, 45, 46 | Corporate and Community Services | Staff Engagement | 2 |
| 5. | Sustainable Office Products | Implement Sustainable Office Products Initiatives (eg eco stationery) | 45, 46 | Corporate and Community Services | Staff Engagement | 2 |
| 6. | Fuel Shock Emergency Management Plan | Incorporate fuel supply shocks as potential risk scenario in business continuity plan | 47, 53 | Corporate and Community Services | Peak oil | 2 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|--|-------------------------------|----------------------------------|-------------------|----------------|
| 7. | Video Conferencing | Implement video conferencing ability for staff to attend regional meetings remotely | 13, 45 | Corporate and Community Services | Peak oil | 3 |
| 8. | Depot Energy Efficiency Upgrades | Conduct a request for quotation on energy efficiency upgrades at the Depot | 22, 45, 46 | Infrastructure Services | Energy Efficiency | 1 |
| 9. | Administration Building Energy Efficiency Upgrade | Improve energy efficiency of air-conditioning system and lighting at administration building as per Australian Standards and WHS | 22, 45, 46 | Infrastructure Services | Energy Efficiency | 1 |
| 10. | BRSCC Energy Efficiency | Investigate energy use patterns at the BRSCC and identify efficiency opportunities | 22, 35, 45, 46 | Infrastructure Services | Energy Efficiency | 1 |
| 11. | BRSCC Solar Hot Water | Install solar hot water at the BRSCC | 22, 35, 45, 46 | Infrastructure Services | Energy Efficiency | 1 |
| 12. | Depot Energy Efficient Lighting | Improve quality of lighting at depot as per Australian Standards and WHS with the view to improving energy efficiency. (eg. LED lighting retrofit) | 22, 45, 46 | Infrastructure Services | Energy Efficiency | 1 |
| 13. | Wastewater Treatment Energy Efficiency | Investigate opportunities for energy efficiency throughout waste water treatment network. As per resolution 13-107.3 | 45 | Infrastructure Services | Energy Efficiency | 1 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|-------------------------------------|---|-------------------------------|-------------------------------------|------------------|----------------|
| 14. | Wind Energy Investigation | Purchase a wind energy meter for monitoring site specific potential for small-medium scale wind energy generation | 46 | Sustainable Environment and Economy | Renewable Energy | 1 |
| 15. | Large Scale Solar Power | Investigate feasibility of large scale solar at Council facilities (eg STW, depot, BRSCC, Admin building, caravan parks) | 22, 45, 46 | Infrastructure Services | Renewable Energy | 1 |
| 16. | Organic Waste Collection | Implement collection and re-use of household organic waste in the Byron Shire to produce a high quality product appropriate for re-use in food and land restoration systems | 22, 46, 56 | Infrastructure Services | Waste | 1 |
| 17. | Resource Recovery Education | Reduce organic waste to landfill and increase awareness of organic and general recycling in the household (incl plastic minimisation) | 14, 17, 45, 46, 47, 56 | Infrastructure Services | Waste | 1 |
| 18. | Organic Waste Reuse | Investigate local uses of residential organic waste collected | 14, 17, 45, 46, 47, 56 | Infrastructure Services | Waste | 1 |
| 19. | Commercial Organic Waste Collection | Develop commercial organic waste collection strategy for business and industry | 14, 17, 45, 56 | Infrastructure Services | Waste | 1 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|------------------------------------|--|-------------------------------|-------------------------------------|-------------------|----------------|
| 20. | Park and Ride Scheme | Implement a park and ride scheme for Byron Bay as per Council resolution 14-293 | 14, 22, 45, 46 | Sustainable Environment and Economy | Transport | 1 |
| 21. | Biofuel Production | Investigate biofuel potential of new organic waste collection | 45, 56 | Infrastructure Services | Transport | 2 |
| 22. | Electric Fleet Vehicles | Investigate opportunities for the use of electric vehicles for parking officers/rangers/inspectors where applicable along with the potential for an integrated charge station network for the Byron Shire. | 22, 45, 46 | Sustainable Environment and Economy | Transport | 1 |
| 23. | Electric Vehicle Charging Stations | Install electric vehicle charging stations throughout the shire | 22, 25, 45, 46, 47 | Sustainable Environment and Economy | Transport | 2 |
| 24. | Eco-friendly Priority Parking | Implement priority/designated car parking spaces for carpooling and electric/hybrid vehicles | 14, 45, 46, 47 | Infrastructure Services | Transport | 2 |
| 25. | Water and Energy Audits | Conduct energy and water audit of Council facilities to identify efficiency improvements (e.g. lighting, insulation, tap locks, hot water) | 22, 45, 46 | Infrastructure Services | Energy Efficiency | 2 |
| 26. | Street Tree Planting | Increase public street plantings | 22, 40, 46, 47 | Infrastructure Services | Carbon | 2 |



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|--|--|-------------------------------|-------------------------|-------------------|----------------|
| 27. | Energy Efficient Street Lighting | Investigate further streetlight and public lighting options for energy efficiency including creative environmental design elements and public safety | 22, 40, 45 | Infrastructure Services | Energy Efficiency | 2 |
| 28. | Electricity Meter Upgrades | Identify electricity meters that can be upgraded to time of use or telemetry to take advantage of appropriate electricity tariffs | 13, 22 | Infrastructure Services | Energy Efficiency | 2 |
| 29. | Timers on Hot Water Systems | Investigate opportunities to install timers on hot water systems in Council facilities (eg childcare centres) | 45, 46 | Infrastructure Services | Energy Efficiency | 2 |
| 30. | Small Scale Renewable Energy Generation | Identify sites for small scale renewable energy generation (eg. solar/wind) | 22, 45, 46 | Infrastructure Services | Renewable Energy | 2 |
| 31. | Leachate Management Energy Efficiency | Reduce energy consumption at landfill by minimising volumes of leachate transported offsite | 45 | Infrastructure Services | Energy Efficiency | 2 |
| 32. | Industry Consultation on Peak oil Strategies | Approach Infrastructure Australia and Engineers Australia on their recommendations to prepare for peak oil in regard to heavy vehicle fleet | 17, 47 | Infrastructure Services | Peak oil | 2 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|------------------------------------|---|-------------------------------|-------------------------|------------------|----------------|
| 33. | Micro Hydro-Electricity | Investigate feasibility of micro hydro turbines in reticulated water supply network | 22, 45, 46 | Infrastructure Services | Renewable Energy | Aspirational |
| 34. | Extend Landfill Gas Capture System | Investigate opportunities for utilising heat produced from landfill gas flare with mindfulness to neighbouring residents | 22, 45, 46 | Infrastructure Services | Waste | 3 |
| 35. | Promote Composting | Investigate options to encourage composting | 14, 45, 46, 47 | Infrastructure Services | Waste | 2 |
| 36. | Water Harvesting | Encourage and promote safe water harvesting and reuse for residents and businesses | 14, 17, 22, 45, 46, 47 | Infrastructure Services | Water | 3 |
| 37. | Fuel Efficient Fleet Policy | Review Council's fleet policy to ensure fuel efficiency (in L/km) and safety are the predominant factors in fleet decisions | 22, 45, 46 | Infrastructure Services | Transport | 2 |
| 38. | Using Biogas/Bio-diesel Fuels | Investigate opportunities for the use of biogas/ bio-diesel in Council fleet and encourage a local biofuels industry | 14,17, 22, 25, 45, 46 | Infrastructure Services | Transport | 2 |
| 39. | Byron Shire Bike Plan | Identify funding opportunities to facilitate the implementation of the Byron Shire Bike Plan | 14, 16, 45, 46, 48 | Infrastructure Services | Transport | 2 |



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---------------------------------------|--|-------------------------------|-------------------------|-------------------|----------------|
| 40. | Improve Bike Plan | Review bike plan to seek new opportunities for improvement | 22 | Infrastructure Services | Transport | 2 |
| 41. | Fuel Efficient Route Maps | Investigate feasibility of route mapping for fuel efficiency via in vehicle GPS in Council's fleet | 13, 45, 47 | Infrastructure Services | Transport | 3 |
| 42. | Promoting School Bus Network | Promote school bus network to reduce number of students driven to school | 14, 45, 46 | Infrastructure Services | Transport | Aspirational |
| 43. | Travel Reduction | Conduct an in house staff engagement initiative to identify new fuel saving and travel reduction techniques | 5, 6, 45, 46 | Infrastructure Services | Staff Engagement | 3 |
| 44. | Fuel Efficient Driving | Conduct staff education/ training for fuel choice and fuel efficient driving techniques | 5, 6, 45, 46 | Infrastructure Services | Staff Engagement | 3 |
| 45. | Byron Bay Library Energy Efficiency | Assess energy use and benchmark the Byron Bay Library to other similar buildings in Australia | 22, 34, 45, 46 | Infrastructure Services | Energy Efficiency | 3 |
| 46. | Water and Sewer Energy 'Smart Metres' | Install 'smart meters' across Shire water and sewerage assets to provide centralized monitoring of energy consumption as opportunities arise | 45 | Infrastructure Services | Energy Efficiency | 3 |



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|--|-------------------------------|-------------------------------------|-------------------|----------------|
| 47. | Alternative Solutions to Fossil Fuels | Investigate alternatives to bitumen use that do not rely on fossil fuels | 22, 45, 47 | Infrastructure Services | Peak oil | Aspirational |
| 48. | Public Bicycle Hire | Investigate implementing a public bicycle hire scheme in the Byron Shire (eg Brisbane model) | 14, 17, 25 | Infrastructure Services | Transport | 3 |
| 49. | Sport Field Energy Efficient Lighting | Continue to install energy efficient lighting and lighting controls in sport fields where possible | 22, 40, 45 | Infrastructure Services | Energy Efficiency | Ongoing |
| 50. | Public Toilet Energy Efficient Lighting | Incorporate energy efficient lighting and natural lighting options in upgrades of Council's toilet blocks with regard for public safety | 22,40, 45 | Infrastructure Services | Energy Efficiency | Ongoing |
| 51. | Revolving Energy Fund | Continue to implement and replenish projects from the Revolving Energy Fund | 24, 45, 46 | Infrastructure Services | Energy Efficiency | Ongoing |
| 52. | Monitor Energy and Fuel Consumption | Continue to work with Planet Footprint (or alike) to manage Council's energy and fuel data to identify wastages and document consumption | 24, 45 | Sustainable Environment and Economy | All | 1 |
| 53. | Tree Planting in New Developments | Amend DCP 2010 to ensure developers establish street plantings in new sub-divisions | 40, 42, 43 | Sustainable Environment and Economy | Carbon | 1 |



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|---|-------------------------------|-------------------------------------|----------------------|----------------|
| 54. | Environmental Levy | Investigate opportunities to continue and expand the special levy to implement the Low Carbon Strategy | 45 | Sustainable Environment and Economy | All | 1 |
| 55. | Virtual Net Energy Metering | Work collaboratively with Essential Energy, energy retailers and the Australian Energy Regulator to develop Virtual Net Metering in the Byron Shire | 13, 16, 17, 22, 45 | Sustainable Environment and Economy | All | 1 |
| 56. | Community Engagement Climate change and Peak oil Planning | Biodiversity & Sustainability committee to workshop with staff potential methods of reducing greenhouse gas emissions and improving peak oil preparedness under the current planning system and proposed planning reforms and identify opportunities to participate | 14, 17, 45, 46, 47, 53 | Sustainable Environment and Economy | All | 1 |
| 57. | Large Scale Event Sustainability | Develop strategy to improve the sustainability and minimise the environmental impact of large events (eg festivals) in the Byron Shire | 28, 46 | Sustainable Environment and Economy | Community Engagement | 1 |
| 58. | Bangalow and Suffolk Park Community Gardens | Support the creation a community garden at Suffolk Park and Bangalow | 15, 40, 46, 47 | Sustainable Environment and Economy | Peak oil | 1 |
| 59. | Ethical Catering | Update list of eligible caterers for the Ethical Catering Policy and promote to staff | 45, 46 | Sustainable Environment and Economy | Peak oil | 1 |



| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|---|-------------------------------|-------------------------------------|----------------------|----------------|
| 60. | Byron Shire Renewable Energy | Support renewable energy projects throughout Byron Shire where possible | 17, 25, 45, 46, 47 | Sustainable Environment and Economy | Renewable Energy | 1 |
| 61. | Carbon Offset Tree Plantings | Investigate carbon offset potential of biodiversity/conservation stimulated tree plantings as a potential revenue generation source | 40, 42, 43, 46 | Sustainable Environment and Economy | Carbon | 2 |
| 62. | Carbon Farming | Promote carbon farming initiatives including soil health, revegetation, bio char and farm forestry | 14, 42, 43, 46 | Sustainable Environment and Economy | Carbon | 2 |
| 63. | Low Carbon Transport | Encourage and promote low carbon transport options to the community | 22, 45, 46 | Sustainable Environment and Economy | Transport | 2 |
| 64. | Climate Change Mitigation and Peak Oil Planning | Incorporate climate change mitigation and peak oil preparedness into local planning strategies | 18, 45, 46, 53 | Sustainable Environment and Economy | All | 2 |
| 65. | Community Solar Campaign | Conduct a community incentive solar campaign (eg Council facilitated bulk purchase scheme including options for low income residents) | 14, 16, 17, 45, 46, 47 | Sustainable Environment and Economy | Community Engagement | 2 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|---|-------------------------------|-------------------------------------|----------------------|----------------|
| 66. | Energy Monitoring | Invest in a set of removable energy monitors to allow for sub metering of Council assets for energy audits and project savings verification | 45 | Sustainable Environment and Economy | Energy Efficiency | 2 |
| 67. | Child Care Centres Energy and Water Audit | Conduct energy, water, waste and chemical use audits at child care centres | 22, 45, 46 | Sustainable Environment and Economy | Peak oil | 2 |
| 68. | Staff Resource Education | Develop staff education program focussing on paper and computer use etc (eg 'Green Points' Rewards program) | 5, 45, 46 | Sustainable Environment and Economy | Staff Engagement | 2 |
| 69. | Composting Toilets | Investigate opportunities for the installation of composting toilets in sewerred areas and large events to reduce load on sewer system | 22, 45, 46 | Sustainable Environment and Economy | Waste | 2 |
| 70. | Sustainability Advantage Program | Promote OEH Sustainability Advantage Program to private businesses | 5, 17, 46 | Sustainable Environment and Economy | Community Engagement | 2 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|---|--|-------------------------------|-------------------------------------|-------------------|----------------|
| 71. | Community Council Services | Investigate decentralising Council community services to the public where appropriate eg use community centres/libraries one day/week or month for public access to Council services | 13, 46, 47 | Sustainable Environment and Economy | All | 3 |
| 72. | New Development Energy Efficiency | Review and amend DCP 2014 to ensure new subdivisions feature energy efficient or renewably powered street lighting and public transport considerations | 38, 41, 45, 46, 47 | Sustainable Environment and Economy | Energy Efficiency | 3 |
| 73. | Commercial and Industrial Energy Efficiency | Investigate amending DCP 2014 relating to commercial and industrial developments to include energy efficiency provisions | 38, 41, 45 | Sustainable Environment and Economy | Energy Efficiency | 3 |
| 74. | Energy Efficiency Planning Framework Input | Investigate opportunities to incorporate proposed energy efficient standards into NSW planning strategic planning framework and proposed codification and make representations as opportunities permit | 18, 41, 46 | Sustainable Environment and Economy | Energy Efficiency | 3 |
| 75. | Food Production on Public Land | Promote food production on public land & develop map for Shire (online) with fruiting trees | 14, 17, 40, 46, 47 | Sustainable Environment and Economy | Peak oil | 3 |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|------------------------------------|--|-------------------------------|-------------------------------------|----------------------|----------------|
| 76. | Review Low Carbon Strategy | Conduct annual review and update of the Low Carbon Strategy to monitor implementation and relevance | 45 | Sustainable Environment and Economy | All | Ongoing |
| 77. | Cross Departmental Collaboration | Work across Council to support implementation of Low Carbon Strategy | 5, 17, 45 | Sustainable Environment and Economy | All | Ongoing |
| 78. | Sustainability Achievements | Council to promote widely its sustainability achievements to public and staff | 14, 45, 46 | Sustainable Environment and Economy | All | Ongoing |
| 79. | Climate change Adaptation Strategy | Conduct annual review of climate change adaptation strategy to improve delivery and relevance to the Byron Shire | 53 | Sustainable Environment and Economy | All | Ongoing |
| 80. | Sustainability Education | Deliver community sustainability education initiatives to reduce community environmental impact. | 14, 16, 17, 46, 47 | Sustainable Environment and Economy | Community Engagement | Ongoing |

| Action ID | Name | Description | 2013-17 Delivery Plan Linkage | Council Responsibility | Theme | Scheduled Year |
|-----------|------------------------------------|---|-------------------------------|-------------------------------------|----------------------|----------------|
| 81. | Northern Rivers Carpool Project | Promote and support the Northern Rivers Carpool project | 16, 45, 46 | Sustainable Environment and Economy | Community Engagement | Ongoing |
| 82. | Sustainability Portal | Maintain an up to date sustainability portal on Council's website | 13, 23, 46 | Sustainable Environment and Economy | Community Engagement | Ongoing |
| 83. | Showcase Byron Bay Library | Utilise the Byron Bay Library as a platform for environmental education to the wider community showcasing its sustainability features | 14, 17, 34, 46 | Sustainable Environment and Economy | Community Engagement | Ongoing |
| 84. | Support Community Gardens | Continue to support existing community gardens | 14, 17, 40, 45, 46, 47 | Sustainable Environment and Economy | Peak oil | Ongoing |
| 85. | Northern Rivers Food Links Project | Continue to support outcomes of the Northern Rivers Food Links Project | 14, 16, 45, 46 | Sustainable Environment and Economy | Peak oil | Ongoing |
| 86. | NBN and WiFi | Investigate opportunities that technology developments (eg NBN and/or WiFi) create for remote working | 13, 45 | Organisation Development | Peak oil | 2 |
| 87. | Sustainability Engagement | Support coaching and mentoring for sustainability across the organisation via internal staff engagement | 5, 46 | Organisation Development | Staff Engagement | 2 |

Conclusion

With future increasing oil prices and rising global temperatures Council is taking action to prepare for changes and mitigate their effects. Encompassing themes of carbon, energy efficiency, transport, staff and community engagement, waste, peak oil and water the *Byron Shire Low Carbon Strategy 2014* outlines a list of actions. Once completed the strategy will assist the reduction of greenhouse gas emissions and drive a shift away from the reliance on fossil fuels. This Strategy which was created through community consultation showcases the active and adaptive approach Council is taking to lead improvement in environmental, social and economic resilience.

The coupling of greenhouse gas abatement and peak oil preparedness into one strategy has highlighted a unique opportunity where efforts to reduce the use of fossil fuels will contribute to a reduction in greenhouse gas emissions and a cost avoidance from the increasing price of such fuels. By supporting the growth and development of sustainable industries the Byron Shire will not only benefit the environment but will be endowed with a more resilient, flexible and prosperous economy.

As a stopping place for people from all around the world projects such as the installation of energy efficient street lighting, the development of community gardens and the implementation of bicycle plans will advocate the Byron Shire as a global leader in sustainability. As a living document the *Byron Shire Low Carbon Strategy 2014* will continue to grow and react to future changes enabling the Byron Shire to thrive as a community rich in a culture of environmental awareness.

