19.1 Ecologically Sustainable Development

The *Environmental Planning and Assessment Regulation 2000* requires that an Environmental Assessment include:

"The reasons justifying the carrying out of the development or activity in the manner proposed having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development."

The principles of Ecologically Sustainable Development, as listed in the Regulation, are as follows:

a) "The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

b) Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

c) Conservation of biological diversity and ecological integrity.

d) Improved valuation and pricing of environmental resources."

19.1.1 Precautionary Principle

To satisfy the precautionary principle, emphasis must be placed on anticipation and prevention of environmental damage (i.e. being proactive rather than reactive). The environmental impact assessment process itself is precautionary in nature, as it provides a public procedure to assess and evaluate uncertainty about the environmental consequences of a development prior to a project proceeding.

A range of environmental investigations have been undertaken as part of the project development and environmental assessment process. Environmental investigations as described in **Chapters 6 - 17** of the EA have been carried out to ensure that potential impacts are understood with a high degree of certainty. The Project has been modified to avoid impacts where possible and to reflect the findings of the studies undertaken. This demonstrates SEFE's precautionary approach throughout the design and development of mitigation controls proposed as part of the development. The controls proposed specifically address the threat of serious or irreversible damage from:

- land use change;
- air emissions;
- GHG emissions;
- noise emissions;
- water discharges;
- land contamination;
- impacts on flora and fauna;
- impacts on marine ecology;
- visual impacts;
- heritage impacts;
- traffic impacts; and
- potential hazards.

Chapter 19 Conclusions

Monitoring of these aspects would be carried out in accordance with regulatory and current best practice and licence requirements. Should deviations from expected conditions be observed, the matter would be investigated immediately and appropriate action taken to prevent any adverse environmental impact as required by the Environmental Management Plans (Construction and Operation) for the proposed Power Plant. This requirement would ensure that the Project achieves a high-level of environmental performance.

The proposed biomass Power Plant would utilise modern technology with known consequences and effects. The technology proposed represents the best industry standard for modern biomass power stations and is used throughout the world by the leading electricity generating companies. SEFE has taken a conservative approach to technology selection. Grate-fired biomass combustion is a mature technology, and SEFE intends to incorporate into the Power Plant design the capability of extracting process heat for any future application which may develop into a viable proposition.

19.1.2 Inter-Generational Equity

Intra-generational equity requires that the economic and social benefits of development be distributed appropriately among all members of the community. Inter-generational equity requires that the development be managed so that the environment is maintained or enhanced, and future generations are not disadvantaged by long term impacts of the development.

SEFE proposes to construct a Biomass Power Plant that would be developed with a total generation capacity of around 5.5 MW. The Power Plant would burn around 57,700 t of wood waste to produce around 31 GWh of electricity per annum. Around 9 GWh will be used to supply the mill and Power Plant with the balance (22 GWh) being exported to the grid. The implementation of the proposed facility would substitute the current site practice of disposing of wood waste from the mill operation as mulch and incinerating the remainder.

The proposed development has been designed to meet with the principles of inter-generational equity in the following ways:

- improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies. The generation of 28 GWh per year by the proposed plant (31 GWh minus the parasitic load from the Power Plant) would avoid the emission of approximately 23,800 t of CO_2-e from fossil-fuel based power generation;
- improve the reliability of part of the local electricity supply through local generation and provide long term economic benefits in the Eden area due to the increased reliability of supply during peak demand periods; and
- investment in base load electricity supply which is market competitive and consistent with current trends and future energy demands.

19.1.3 Conservation of Biological Diversity and Maintenance of Ecological Integrity

The conservation of biological diversity and maintenance of ecological integrity refers to the maintenance of species richness, ecosystem diversity and health, as well as links and process between them. Environmental components, ecosystems and habitat values potentially affected by the proposed development are assessed and described in the EA. Potential impacts are outlined in **Chapters 6-17** along with mitigation measures proposed to ameliorate any negative impacts anticipated.

The proposed biomass Power Plant would not significantly affect the biological diversity or ecological integrity of the Twofold Bay area. Studies conducted for terrestrial flora and fauna and marine ecology indicate that no rare, endangered or threatened species are likely to be impacted adversely by the proposed development.

19.1.4 Improved Valuation and Pricing of Environmental Resources

The goal of improved valuation of natural capital has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment. The principle of improved valuation and pricing refers to the need to determine proper values of services provided by the natural environment. The objective is to apply economic terms and values to the elements of the natural environment. This is a difficult task due largely to the intangible comparisons that need to be drawn in order to apply the values.

Waste from SEFE's current milling operations comprise hardwood fines, pine bark, hardwood mill waste and pine fines. The utilisation of this waste to produce electricity affords a much higher resource value than is currently achieved by incineration and sale of waste for mulch. The proposed biomass Power Plant would redirect approximately 57,700 t of material from essentially a waste stream, to a much higher value added utilisation. While it is noted that up to 30% of fuel may originate from nearby facilities, the EA stipulates that only wood waste would be burnt in the Power Plant. No native or plantation forest would be felled for the particular purpose of fuelling the Power Plant. The alternative use of this waste wood for electricity production would equate to a CO_2-e emission avoidance of 23,800 t per year.

The proposed biomass Power Plant would capitalise on opportunities presented by market incentives which promote the transition to renewable electricity generation. As outlined in **Chapter 3**, eligible renewable energy sources under the RET include hydroelectric, wind, solar, biomass, geothermal, wave and tidal energy. Wood waste electricity generation by SEFE (inclusive of wood waste residue from third party sawmills) would be eligible to create approximately 26,831 RECs annually.

The application of ash from the combustion process to land in forestry production would constitute further project benefits in terms of improved valuation of natural resources. As outlined in **Section 17.3**, in-forest application of furnace ash is proposed at a SEFE owned and managed site at Rockton, NSW. This would be subject to further consultation with DECCW, however if approval is obtained, a number of additional project benefits would be anticipated.

Chapter 19 Conclusions

The Rockton soils are low in phosphorus plus a number of other plant nutrients. Application of the ash would reduce, if not eliminate, the need for use of phosphorus based fertilisers on subsequent plantation rotations. There would be an increase in the pH of the soils treated with the ash. It is anticipated that this would eliminate the need to apply lime, and overall, in-forest ash application would significantly improve plantation productivity. At an application rate of 10 tonnes per hectare, the fertilising value of the ash (based on actual fertiliser prices and the average nutrient content) is calculated at about $400.00 per tonne.

The EA has identified potential impacts of the proposed biomass Power Plant, and has identified mitigation measures which would be applied to ameliorate any adverse impacts. The construction and operation of the Project would be in accordance with relevant legislation as well as construction and operational environmental management plans. Appropriate environmental management would increase both the capital and operating costs of the Project. This signifies that environmental resources would be given appropriate valuation.

19.2 Environmental Assessment Findings

A brief summary of the main findings of the Environmental Assessment is presented below.

Land use

- The operation of proposed Power Plant would not result in any offsite impacts that restrict future changes in land use zonings.
- The application of ash (subject to further consultation with DECCW) would result in a beneficial outcome for the Rockton plantation.
- Existing and proposed operations at the SEFE site do not represent a potentially hazardous interaction and would therefore remain compatible as defined by the defence safeguarding zones.

Air Quality

- Contour plots for all criteria pollutants over all modelled durations show that peak ground level concentrations would be generally restricted to within 1km of the plant.
- The ESP emissions proposed for the facility comply with the relevant emission limits specified in the Clean Air Regulation.
- The predicted impact of NO_X (as NO_2), CO, SO_2, PM_{10}, lead and HAP emissions from the Power Plant were shown to be below regulatory criteria and no adverse impacts on local air quality would be anticipated.
- No air pollution emissions above the designated guidelines are anticipated as a result of the construction or operational phase of the proposed plant.

Greenhouse Gas Emissions

Consideration of avoided emissions indicates a net greenhouse benefit where a low greenhouse emission energy supply displaces higher greenhouse emission intensity forms of electricity generation. Annual avoided emissions have been calculated at approximately 23,800 t CO_2-e.

Water Quailty

- The proposed concept design for the cooling water diffuser aims to minimise thermal discharge impacts.
- Modelling has indicated that the mixing zone for thermal discharge would be located where the final temperature from the discharge point is 2.4^{o}C above the ambient temperature. This would be within 1m of the outlet in summer and within 3.5 m in winter.
- Far field modelling has determined that the thermal plume would be unlikely to reach the shore or touch the seabed at a distance within 200 m from the outlet. At this distance the temperature rise would be 0.3^{o}C or less.

Visual and Landscape Impact

- Overall the physical characteristics of the landscape surrounding the Power Plant site are generally robust and consistent and are unlikely to be affected by the development.
- The degree to which the existing landscape may accommodate (or visually absorb) the proposed Power plant is likely to be high given the existing industrial nature of the SEFE site and dense timbered areas which form the backdrop to the SEFE site from a number of surrounding view locations.

Noise and Vibration

- Cumulative noise levels would exceed the noise goal at the closest identified receptor (at night time and under adverse conditions). This Impact is not considered significant due to the current background noise levels experienced.
- Exceedances of noise goals are expected at the SEFE Camp, but impact would be minimal as the dwelling is generally not occupied.
- Exceedances during typical operations are expected to be < 1 dB.
- Predicted noise levels comply with sleep disturbance noise limits.
- No exceedance of the construction noise limit is expected at any residential location.
- The predicted increase in road traffic noise during construction is negligible.

Cultural heritage

No Aboriginal objects or indigenous heritage values were identified in the proposal area. The heritage investigation noted that the proposed impact areas have been subject to extensive and high levels of previous disturbance. The archaeological and cultural sensitivity of the proposal area is therefore very low. As such, the proposed SEFE Power Plant would not likely effect an adverse impact upon Indigenous Heritage.

Chapter 19 Conclusions

Traffic and Transportation

Current operations at the SEFE mill site and the relatively minor increases in traffic volume predicted from Power Plant construction and operation indicate that the development is unlikely to have a significant impact on the local or regional traffic network.

Terrestrial Flora and Fauna

- The proposed works are not 'likely' to impose a 'significant effect' on any threatened species listed under the TSC or EPBC Act.
- Habitat assessment results concluded that, despite there being records of threatened species within 10 km of the Site, it would be highly unlikely that they would occur within the area of proposed impact. The site inspection highlighted the generally low condition of landscape vegetation and regrowth.
- Factors considered in determining the significance of potential impacts upon transient, seasonal or migratory fauna species included the small amount of very low quality habitat to be impacted, the existing level of degradation, high levels of disturbance (plant, vehicles etc), and the wider regional context.

Marine Ecology

Anticipated project impacts would be largely limited to the following:

- changes in fish and invertebrate community structures in the direct vicinity of the outlet;
- potential mortality of sessile organisms in close proximity to the outlet;
- potential avoidance of the site by the weedy seadragon and other species with low upper temperature ranges;
- potential temporary avoidance of the construction site by marine mammals as a result of construction noise; and
- reduced access to the chip mill jetty for recreational divers.

Risks and Hazards

Bush fire potential, plume rise (aviation safety) and contaminated land have been investigated as part of the EA.

- Based on existing APZs for the proposed work site the risk to life and property from bush fire hazard is rated as low.
- CASA requires industrial facilities to notify them if exhaust plumes are likely to exceed critical velocity at a height > 110m. Stack emission design ensures that plume velocities would depreciate below 4.3 m/s within metres of the stack top, and would remain well below 110 mAGL.
- Considering the limited scope of the proposed development, a number of general measures have been proposed to reduce potential exposure of contamination to surrounding environment, should contamination exist.

19.3 Conclusion

This Environmental Assessment has considered the potential impacts of the proposed biomass Power Plant. It has been prepared in accordance with the provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* and the requirements of the Director-General of the NSW Department of Planning.

The Environmental Assessment has documented the potential environmental impacts associated with the Project, considering both potential positive and negative aspects and recommending management and mitigation measures to protect the environment where required.

Overall, the proposed Power Plant would bring about a number of direct and indirect benefits to SEFE, the Bega Valley Shire and to NSW more broadly.

The most significant project benefits explored throughout the EA include the following;

- improved security of electricity supply. SEFE currently experiences outages and onsite generation will remove this risk;
- the generation of electricity from renewable biomass material in contrast to current practice which under-utilises a valuable resource;
- the supply of around 22 GWh of base load power annually to the electricity grid;
- improved reliability of the local electricity supply through local generation;
- contribution towards long term economic benefits in the Eden area through increased reliability of electricity supply during peak demand periods; and
- improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies. The proposed plant would potentially avoid the emission of 23,800 t of CO_2-e from fossil-fuel based power generation per year.

There are no major adverse environmental impacts anticipated for the proposed biomass Power Plant. The Environmental Assessment concludes that many of the potential issues identified have already been ameliorated through project design features. To manage other issues, a number of mitigation and management measures (commitments) have been outlined in **Chapter 18**. Commitments made by the Proponent include the preparation of a Construction Environmental Management Plan and Operational Environmental Management Plan to ensure that the mitigation and management measures contained in this EA are developed, implemented and monitored. These plans would also ensure compliance with relevant legislation and any conditions of approval.