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| **PROFESSIONAL SCIENCE DOCUMENT WRITING** |
| How Does Algae Support Building Technology in Australia |
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# Executive Summary

Modern-day construction has adopted a new building material which is a much-required innovation. Algae are now used for building construction in many countries (Martokusumo et al., 2017). The policy brief is about how does algae support building technology in Australia. The renewable energies are running out and Greenhouse gas emission (GHS) has become a major concern for all. The paper highlights the policy issue of the current policy. The major issue of the current policy is that it does not provide any discussion on whether this technology will work in Australia or not. The current policy does not include any drawbacks of using the building material. The current policy needs to be revised by adding these points so that the policymaker makes the policy easily understandable to the readers. It is recommended for the policymaker to make the policy with a brief description of the benefits and drawbacks of using Algae as a building material.

# Purpose

The major issue that has been addressed in the policy is that whether Algae building technology will work in Australia or not. Earlier, Sunlight and wind were used for making natural source of energy but now algae are entering into the construction business. It brings a new dimension in the construction business (Chang et al., 2017). The addressed issue is important because there are many advantages of using algae as a building material and Australia is having a huge source of algae. Australia can use this source of algae and make a great change in the construction concept. Many people will be benefitted of this- the constructors, people who will live in those buildings. There are some other issues which are also addressed. The current policy does not include any drawbacks of using algae as a construction material. The causes of the issues are mainly lack of proper research and market survey. The current policy does not include these points and for that reason, it is not clear to the audience. The purpose of the policy paper is to make a policy brief with overall information about the topic so that the audience can understand clearly the importance of the issue. The data collection method for the making of the policy paper is secondary data collection method. It includes both qualitative and quantitative data. Qualitative data is obtained from journals, patents, and articles. Quantitative data is obtained from the interview.

# Critical Analysis

According to Gabrielson et al., (2018), algae is now being used as a building material. Sara Wilkinson the professor of Built Environment, marine biologist Peter Ralph and architect Paul Stoller presented a view on the use of algae on the building facades. It can be used as a source of energy and shades for the buildings. They got the idea after seeing the construction of Arup designed building in Hamburg, Germany. The buildings were with algae façade panels and the entire project is called the Bio Intelligent Quotient House (BIQ). There are 129 algae-filled louvered tanks which are hanging on the exterior of the building (Sara et al., 2017). This BIQ building is the first-ever algae-constructed building in the world. This is designed by SSC Strategic Science Consultants and Splitterwerk Architects. This project opens eye for new age construction using algae to maintain temperature inside the buildings. The current policy missed discussing some points which are already highlighted in the previous section. Secondary data collection method helped to gather information about the possibility of success in algae building technology. Interviewing construction professionals, engineers, building surveyors, property managers, and contractors helps to gather information about that. Algae can be produced in the rivers of Australia (O’Connell, 2019). So it means Australia is highly potential for that. Australian seas are the main source of algae and nearly 1300 species are found in Australian sees (Lewis et al., 2017). Algae now become a major component for constructing zero-carbon buildings in the Australian construction business. The reason for using algae is that algae can heat and cool buildings. It can fertilize rooftop gardens. Now consumers become more environment-friendly so they would love to stay in the buildings with Algae building technology (Lockhart et al., 2005). After interviewing 29 stakeholders and reviewing kinds of literature, many reasons are identified for the sustainability of algae building technology in Australia. The current policy needs to be changed by adding some benefits of using algae support building technology. The benefits of algae building technology are listed below:

1. Biofuel is good for the environment
2. Algae reduce carbon footprints
3. It reduces greenhouse gas emissions
4. It has the potential for earning revenue from industrial chemicals or sustainable materials
5. Long-term savings can be done as the cost of fossil-based energy is increasing
6. Highly innovative and attractive technology
7. Aware people about new renewable resource
8. It can provide sustainability in the construction environment

The drawbacks include the weather of Australia is different than Hamburg. Algae require sunlight but there is no sunlight in winter in Australia (Martokusumo et al., 2017). Then the climate of Australia is quite different than Germany so the production cost will be higher. Next drawback of using algae in construction is that maintenance issue as it is an unknown technology for Australian constructors. Competition with other renewable is the next thought of concern (Narala et al., 2016). There are various renewable energies like wind and photovoltaics (PV). Solar energy is highly used in Australia so the adoption of new technology will be a difficult task. The structural issue is a common thought of everyone. The additional weight of the algae façade may require additional space, strength, and costs. Cleaning of the facades is another concern. Visual checking and manual cleaning are required for cleaning and it will incur an additional cost (Ordoñez et al., 2018). Besides these drawbacks, some other disadvantages are odors, contamination, and leaks.

The current policy is inadequate as it does not include these points. A policy becomes complete when it provides an overall view of the topic including the benefits and disadvantages of the topic. The strength of the policy is that it provides a clear understanding of the algae production source in Australia. It also describes the process of using algae in construction technology. Stakeholders like investors, architects, bank insurance companies and customers would be affected by the policy if it is not revised with these additional points. Different stakeholders are implicated in the issue because the policy does not include the downside of the project. This policy change would benefit people’s lives because they will understand the importance of using algae in building technology besides that they can realize that Australia can be a potential country for the idea (Ouargui et al., 2018).

# Policy Implications and Recommendations of Research

The drawbacks mentioned in the previous section can be overcome with the following recommendations.

* Algae production can be done in a glass panel in Australia as the climate of Australia is different from Hamburg (Poerbo et al., 2017).
* To reduce the time of maintenance, it is recommended that the training program and education of the professionals in this business are must (Shahdan et al., 2018). This training should be given to building managers, property managers. Public awareness program should be organized to educate Australians with this technology.
* To sustain in the competitive market, the constructors should approach to environment-friendly stakeholders and shareholders (Stanaszek-Tomal, 2017).
* To reduce the additional cost of algae façade, using lightweight structural materials for façade is the best option.
* It is recommended that regular and computer monitoring of the buildings can be beneficial (Talaei et al., 2017). The cleaning should be done through long water pipes. Special glazing with low friction coefficient can reduce algae biofilm formation thus the cleaning process will be much easier.
* Odors can be reduced by planting flower plants and spraying fresheners.
* Contamination can be stopped by aeration. In aeration, oxygen level is increased in the water to refresh water .
* Leakages should be dealt with using proper glue.

People's lives can be changed once the technology is used in the Australian construction business. This is an environment-friendly and renewable source of energy. Air pollution has become a major problem around the world due to Greenhouse gas emission. Algae support building technology will heat and cool buildings in winter and summer so people do not need to use coolers, air conditions and heaters for that. The paper provides in the section showcase how society saves cost and be benefitted using this technology.

Therefore it can be concluded that Australia is highly potential for algae building technology. There are lots of benefits for using the technology. The current policy needs to be revised by adding the advantages, drawbacks and the feasibility of the technology in the Australian construction market. This policy brief has provided the policy recommendations which are relevant to the identified issues.

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# About

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