

SUSTAINABLE ENERGY REPLACEMENT FOR ASPHALT: SOLAR ROADWAYS

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Situation

The goal of this research project is to replace the current asphalt roads with an alternative that will make use of the thermal energy both from the sun's heat and the friction from car tires that was previously wasted on heating up the asphalt. Apart from that, this alternative will also be used to harvest unused solar energy. This alternative is solar roadways; extremely durable and high-load bearing solar panels modified to be able to harvest both thermal and solar energy. This alternative will also address many of the other issues faced due to using asphalt in road construction.

Figure 1 : Load bearing of solar panels [1]



Problem

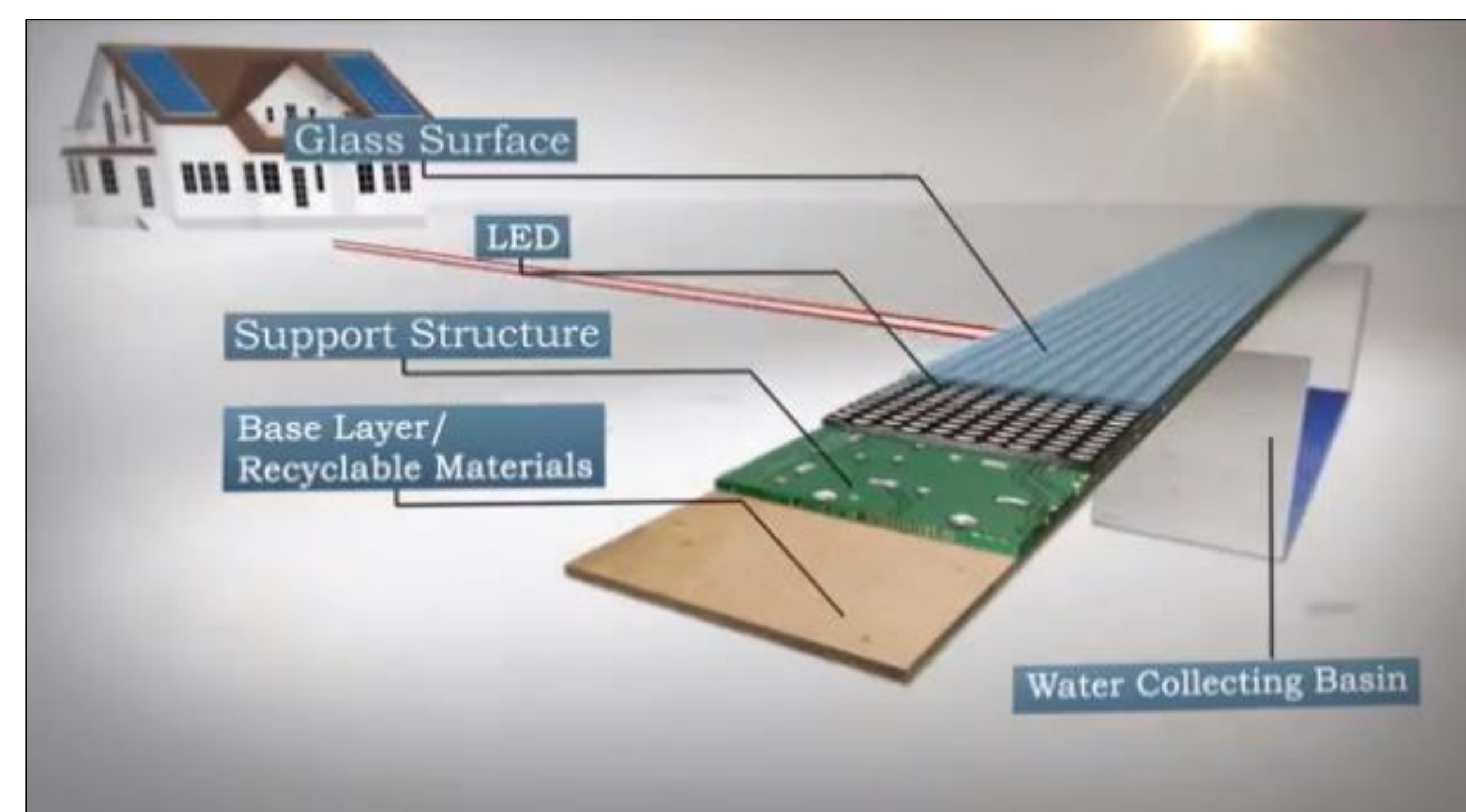
Repairing and maintaining asphalt roads takes a lot of time and costs a lot of money (asphalt itself is cheap but the process of repairing and maintaining it is expensive). Moreover, many roads perform poorly under certain weather conditions such as heavy rain

and snow. Also, in the process of repairing asphalt roads, severe traffic jams will be caused and detours will be needed eventually. Not to mention pot holes, cracks, stagnated water and many other undesirable problems.

Solution

The panels themselves can withstand very harsh conditions; they have very high strength and are very durable. They store both solar and thermal energy that can be used for street lights, melting snow, power LEDs to form street markings and sensors for road management and most importantly generate domestic electricity. These panels can be easily removed and replaced – panels can be removed and replaced one at a time. The road markings are computerized and can be used for several purposes like spawning warning signs for drivers in a matter of seconds. Furthermore, most of the materials used in these panels can be recycled helping in reducing costs over time.

Figure 2 : Layers of the solar panel [2]



Evaluation

Figure 3 : LED view [1]



- Provides many job opportunities in the fields of manufacturing and programming.
- Environmental friendly given that it is made from recycled materials and collects thermal and solar energy.
- Expensive but very economical in the long run as it saves a lot of repair costs.
- Further research is still to be done.

References

- [1] Brusaw, S. (2014), "solarroadways.com", 2014. [Online]. Available: http://images.says.com/uploads/story_source/source_image/300898/ff44.jpg
- [2] Cornett, S. (2014), "solarroadways.com", 2014. [Online]. Available: <http://www.solarroadways.com/highrespic.html>