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SMART SOLAR ROADWAYS

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Abstract

Creating Roads that never gets crack or hole in it, Does not need to be repaired frequently, Protects your vehicle from damaging & Produces 3X more power than the consumption of the entire country! This all can happen by using Solar panels. However, these are specially designed Smart Micro-processing Interlocking Hexagonal Solar Units. These units are covered with specially designed hard tempered glass and can bear heavy loads. Not only these are unbreakable solar units and produce pure energy but also they can provide smarter features that would make driving safe and living better. This can be done by integrating LED strips built right into the circuit board itself.

Imagine having glowing boundaries on the road so that you never get out of track. Imagine if the road can alert you by LED text to slow down when there are animals crossing the road ahead! And imagine if you can actually convert Baseball ground boundaries to Hockey ground boundaries and play both the games on the same ground!

Using this technique, Roads never need to be painted again. Instead, we can programme them according to our needs.

Moreover, this technology pays for itself! It even gives us back our energy and keeps the environment safe.

This technology is being already under development and facing continuous success.

Solar Power also creates jobs.

This paper explains all these points and factors in details further.

Index Terms: Solar Roadways, Smart Roadways, Solar Smart Roadways, Energy Production, Construction.

1. Introduction

'Smart Solar Roadways' is the technology that replaces following with Solar Panels:

- Roadways
- Parking Lots
- Sidewalks
- Driveways
- Airport landings
- Outdoor services

The Solar Panels used are specially designed

"Smart Micro-processing Interlocking Hexagonal Solar Units (S.M.P.I.H.S.U)". The word 'Smart' indicates the features that it provides which is unique and currently not seen in the world. While 'Solar' represents the solar panels it uses to produce energy.

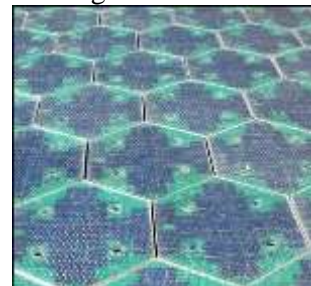
Roads are probably the most exposed thing to the direct sunlight and hence should be arranged and integrated with technologies in such manner that it stores energy from the direct sunlight it receives. If Roads are able to store energy from the direct sunlight it receives then it can produce 3X more energy than the entire country consumption! That would end our energy problems forever. This is all possible by using hexagonal in shape solar panel units specifically designed to bear heavy loads by covering it with hard tempered glass that can

withstand high pressure and volume. This combination of solar panels made hexagonal in shape so that they can form structures using their interlocking abilities and hard enough to withstand heavy tractors and vehicles together allows us to create advanced glass Roadways, Parking Lots, Sidewalks, Driveways, Outdoor Services and Stadiums.

If the same hexagonal units are integrated with LED strips into the circuit board itself then those units will also act like low energy display boards and will be able to make alerts, and surface useful information on the road itself while the driver is driving.



Interlocking Hexagonal Pattern



1.1 Roadways – Basic Features

Roadways built using solar panels and smart processors give us the roadways that are efficient and more powerful than the current models.

- They do not get Cracks or Holes on it like concrete.

- Thus, They don't need to be repaired frequently.
- They absorb the direct sunlight whole time instead of wasting it like concrete roads do.
- Such stored energy helps us to produce 3X more energy than requirements.
- They do not damage the vehicle and instead protects your vehicle for longer life.
- They can handle heavy loads working on it.



Fig-1.1.a: Solar Panels Bearing Heavy Load.

- They generate energy, which in turns generate capital.
- Solar energy is the only Free and Infinite energy that pays for itself.
- As a result, the costs of energy becomes low.
- It provides us the clean form of energy.
- It allows us to make the environment cleaner and pollution free.

LED strips built into circuit board expands the applications into a wider area.

All the above features are the ultimate solutions to the problems we face today. Today we are experiencing badly constructed roadways having holes and cracks in it which in turn damages vehicles and overall costs more to repair as well as wastes the direct sunlight it receives.

Even though the basic features of the concept are big enough to solve major problems, this technology is far bigger than that. By using LED strips into the circuit board we can expand the usage and applications of these roadways. Once the LED light strips are mounted over in hexagonal solar power units, then the roads can literally talk to us just like our Smartphone do! They can alert us for any speed limits or animals passing ahead and more!



Fig-1.1b: Solar Roadways Illustration.

1.2 Roadways – Advanced Features

LED lighting strips and the heat it produces takes the project to the new level. The roadways can draw digital outlines in parking areas and sports ground. As a result, There would be no need of painting the road again, ever! Instead, we can simply programme the road as per our requirement. Here's what these roads can do with such advanced smart features:

- Roads, Parking, and Stadiums never need to be painted.
- Instead, LED lights will do it according to our needs.



Fig-1.2.a: Sports Stadium Outlines Painted Digitally.

- It can melt snow and maintain the road temperature to Prevent high costs of road filtering in snowy areas.



Fig-1.2.b: Snow Melting representation.

- It can pre-alert driver to speed down when animals ahead are passing or when big rocks (boulders) are falling on the road.



- This can draw any warning signs as per requirements.



Fig-1.2.c: Roads Alerting System representation.

- Parking lots can provide space to any car based on digital markings. No more painting required!



Fig-1.2.d: Smart Parking Lots showing reserved places.

- These roadways have glowing boundaries, so that driver doesn't get out of track!



Fig-1.2.e: Glowing Boundaries at end of track, Netherlands.

- In Airports, The pilot can have improved visibility of road where the plane is to be landed from the air level itself!
- Stadiums never need to be painted so one can use any stadium to draw the outlines of respective games and convert ground of any one game to another!

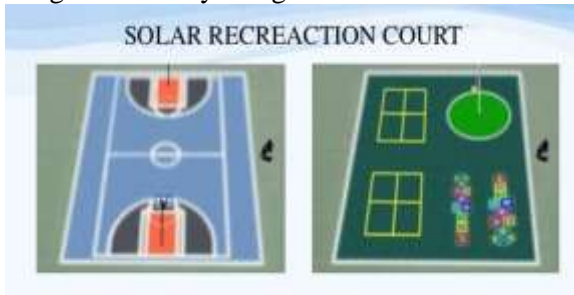


Fig-1.2.f: Solar Sports Stadium outlines drawing application using solar panels & LEDs.

- Festive Lighting – Authorities can control roads and decorate from their offices without any hard work.



2. Environment and Manufacturing

Although these solutions can provide us cleanest form of energy, we still need to create the hexagonal units of machinery. However, Recent studies have suggested that these machines can be created by using maximum of recycled wastes and still be of same quality and efficiency!

These solutions also provide Jobs!

According to the research made by The University of Massachusetts, If 1 million dollars are to be invested into the industry then the solar industry would create more jobs than coal, natural gas and wind industries!

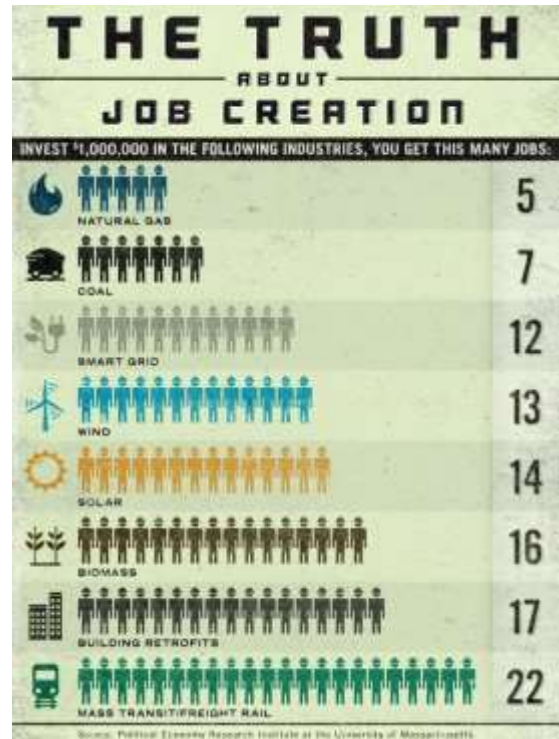


Fig-1: Official chart revealed by the University of Massachusetts.

This entire project requires work from several sides of engineering. We need Civil Engineering for the aspects of road making, Electrical engineering for solar panel support, IT and CS engineering for connectivity and handling these roadways remotely via dedicated authority. We also need a specific system and framework upon which underground cables and water can be managed.

We can use 2 dedicated channels. One will contain all the underground wires like of High-speed internet connections and telephone lines. While the other will contain the rainwater and other water that takes this water to a treatment facility. Having these 2 channels will make it easier to access and manage the system provided that both the channels can have a large opening side so that workers can get into them.

3. Disadvantages of Solar Power

Solar Energy doesn't have many disadvantages. Infact, we can rely on this power source. However, the only one disadvantage is that sun shines only at day and not at night. Also, there are some weathers where sunlight is not that accessible. So to conquer that disadvantage, we need to create reliable power storage stations that can pull out power generated by panels and store them securely for our needs.

This Disadvantage is a solvable problem.

4. CONCLUSION

The Roadways are the most exposed thing in the world to direct sunlight. We should make it absorb solar energy and utilize it to our needs. Solar energy is going to be the

future and it is also purest form of energy and keeps nature safe. By using this specific technique, we can make the driving experience safer, better and robust. We can avoid accidents, save space & have digital sign boards on road and smarter life. We can bring all our engineering efforts from different streams into one project and greatly improve the quality of life.

ACKNOWLEDGEMENT

This technology is already successfully tested and being worked upon in foreign countries. Experimenting too much with this technology for past decades, Scientists

have successfully found the unbreakable materials, interlocking solar panels and other requirements for this project which makes this project possible. Several start-ups are being funded over this topic and thus we can expect this to roll out in the world much more sooner than we expect!

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