Episode 14

Modern Energy...Universal Right

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Sound of the door bell. Creaking sound as door is opened.

Dr Sandip: Oh Ananya...come in...come in.

Ananya: Namaste Sandip Uncle. Haven't met you for a long time. So I decided to drop in.

Dr. Sandip: You did a good thing. **Raises his voice.** Sudha...do you hear me...Ananya is here.

Dr. Sudha: How are you Ananya? I thought you had gone away to work with the indigenous tribals .

Ananya: Yes aunty. I had. I returned just yesterday but missed Sandip Uncle so much t hat I dropped in today.

Dr. Sudha: Have you decided to work with the tribals on Energy?

Dr. Sandip: We will find out soon enough, Sudha. Why don't you ask Surja to make us some tea and snacks.

Dr. Sudha: That goes without saying. **Raises her voice**. Surja...Surja make some tea. **Her voice fades as if she leaves the room and goes into another room.**

Dr. Sandip: So how was your trip? I think you stayed there for about a month, didn't you?

Ananya: Yes Uncle. There is an NGO that works on the mainstreaming of the adivasis...they had invited me over.

Dr. Sandip: So, they wanted to introduce a journalist like you to the nuances of tribal lifestyle.

Ananya: Well, in a way yes they wanted to introduce me to the tribal way of life but they also wanted me to provide some solutions. However...

Dr. Sandip: However? What is this however? If there is some problem please share it with me. Maybe someone like me, a scientist who works on the energy issue, may be able to provide a solution.

Ananya: Yes Uncle. Energy is at the root of the issue and if we can find a solution, then it will be of great benefit to the farmers and to the tribals too.

Dr. Sandip: Ananya, your career has just been launched and you have taken such interest in journalism. If we can find an inexpensive and sustainable alternative to energy resources being used...that would truly be a giant step for the world and the environment too.

Ananya: But are there really any such viable technology? I do know that after the Climate Change Accord, there was talk of a Green Climate Fund and some amount did flow into this fund. However, the poorer nations and the developing nations do not have access to any viable technology connected to green energy....well, with the exception of solar energy, maybe.

Dr. Sandip: Solar energy has enormous potential is being swiftly embraced by the nation. Your aunty has even represented her institute and delivered a lecture on Solar Energy at the Delhi University.

Ananya: But solar energy will only work as long as the sun is shining...what will happen when the sun sets?

Dr. Sudha: Once the sun sets, the battery that has been charged throughout the day will light up the night...Ah! Surja....please keep the tea here.

Sounds of cups and plates etc.

Ananya: But aunty, the solar panels are expensive and the solar panels are often uprooted during storms. Under the circumstances, how will we ever be able to provide uninterrupted and inexpensive power supply to the villages and towns?

Dr. Sudha: Let's come to grips with the technology first. Then, we will talk of expenses. German architect André Broessel has created a transparent globe or let us say orb like lens that can focus energy from the sun and concentrate it onto a small surface of tiny solar panels. Compared to standard solar panels, the glass orb occupies just 25 per cent space and is doubly efficient.

Ananya: Yet...it is foreign technology...granted a good one and efficient...but what about night-time? Will it still work?

Dr. Sudha: Well, Andre's company is customising chargeable devices for items as different as mobile phones and electric cars.

Ananya: What about the cost?

Dr. Sudha: It is a little expensive at the moment but once demand picks up, the prices will drop automatically.

Dr. Sandip: This technology has been short listed for the World Technology Award this year. Of course it remains to be seen if it wins or not.

Ananya: Well, massive efforts are on to find alternative sources of energy that are inexpensive and sustainable...some discoveries may have been made... but the quest is far from being over.

Dr. Sudha: THAT will ALWAYS be the case. As long as the human race survives the search will never end...some will be relevant; others....

Dr. Sandip: There is nothing intrinsically right or wrong in science. It is a quest for knowledge...Sometimes a technology criticised during a period in time has been lauded in another.

Dr. Sudha: China has introduced trams driven by Hydrogen. Think about it...mankind has for long known how to make Hydrogen from water.

Dr. Sandip: Hydrogen's combustible nature was a reason behind many brain-storming sessions. So some people started using water to drive cars; other used it to drive trams. Still, these uses are mere innovations not inventions.

Ananya: Uncle, do you mean if we fine tune an old and well-known technology and make it more efficient or simple to use it will still not count as an invention?

Dr. Sudha: Well, not entirely. See, if you store Hydrogen under very high pressure, it may explode. However, nanocarbon tubes created with this purpose are more robust than steel.

Ananya: Nano...meaning a factor of 10^{-9} or one billionth of a metre. But Hydrogen has been implicated in many accidents, hasn't it? Have we developed technologies to handle it securely?

Dr. Sandip: That is a little difficult to claim but Yes, we have heard some exceptional success stories and results that make us optimistic enough to say that perhaps someday, we will find a solution to the energy crisis and that too without using the sun.

Ananya: Energy without using the sun! Yet Hydro energy or energy from water and nuclear energy are such examples anyway. Actually I am interested in learning more about clean, inexpensive and sustainable sources of non-solar energy that will benefit our villages and tribal areas.

Dr. Sudha: Ananya, you are a journalist. However, you are aware about your social responsibilities and do not limit yourself to simply reporting the news. This is commendable.

Ananya: Dr. Sudha aunty, I have had the opportunity to meet with so many different types of people and organizations....for example...businessmen, scientists, doctors etc., and NGOs of different kinds, citizen communities....you name it. I think that a journalist has unrivalled opportunities to network. So I think, why not take everyone together and do something worthwhile? Some people...journalists are doing so.

Dr. Sandip: That is the right attitude. If only people could overcome their concerns for selfish gains and rise above self-serving interests to contribute to help those who are at the bottom of the social strata...well then, solutions will always be found.

Dr. Sudha: The emphasis today is on solar power and wind power. Take for example, France's iconic Eifel Tower. Two wind turbines have been installed here to harness the energy of high velocity winds blowing through the Tower. The initiate was aimed at providing electricity without any consequences for the environment.

Dr. Sandip: The Japan Aerospace Exploration Agency, or Jaxa, has announced its plans of long range wireless power transmission by deploying solar panels in space and sending the generated power back to Earth without any transmission lines whatsoever. So, the technology does exist but almost half of the global population relies only on solar power for energy...and can you imagine development without electricity?

Ananya: No Uncle, it is not possible to talk development and not include electricity. I am also on a quest for cheap and reliable source of energy. Some agencies have collected a corpus to this end. However, all advance seems to hit a roadblock at solar energy and to tell the truth, the fund is also not enough to ....

Dr. Sudha: Since you are searching...you will surely find a solution. Maybe it is lying unrecognized in some laboratory. It could transform everything if it falls into the right hands...the hands of a journalist and a businessman who could take it up and implement it.

Ananya: That is possible, aunty. Does such a technology exist?

Dr. Sandip: Ah! ...Such a technology? Hmmm. You must have heard about the hydro electric cell.

Ananya: No Uncle, I do not know about hydroelectric cell. I know about the photo electric cell or solar cell...but hydro electric cell...No...sorry.

Dr. Sandip: Well, it looks like your quest is at an end. The hydro electric cell is the brain child of an Indian researcher.

Dr. Sudha: Yes, hydro electric cell or a cell that can produce electricity from water. This was a goal many huge research organizations across the world had been pursuing. However, success was claimed first the Indian scientist Dr. R. K. Kotnala.

Ananya: Wow...what a huge achievement! Yet Dr. Kotnala is calmly sitting on this discovery. I must meet him. I want to know the details.

Dr. Sandip: Oh.. Ho...we can arrange for you to meet him. He is a scientist at Delhi's CSIR- National Physical Laboratory. He has received many awards. And the best thing is that a few days back your aunty ran into him at a local cafe.

Dr. Sudha: Here...take this...it is his contact number. Actually I had presented my research paper on the effects of particulate matter on the lungs and I found out that Dr Kotnala had contributed to characterization of particulate matter for India. And now we keep in touch.

Ananya: So, you can arrange for me to meet him. It is 6PM now, so perhaps I should meet him tomorrow...it is late...

Dr. Sandip: Really! Sometimes you journalists are so divorced from reality. Scientists like Dr Kotnala do not work 9 to 5 shifts. It has been a regular habit of his for the last 25 years or so to stay on in the lab till 9 or 10PM...yes, even on Saturdays and Sundays.

Ananya: Oh! He is a very committed person then; Dr Kotnala I mean.

Dr. Sandip (laughing): News may be cooked up from hot air but work...real research work goes on non-stop night or day.

Dr. Sudha: Let me talk with him.

Sounds of a number being dialled and a phone ringing.

Dr. Sudha: Dr Kotnala? Namaste. This is Dr. Sudha. Yes...Yes. Actually I need a small favour from you...my nephew Ananya ...he is a journalist and he would like to interview you for his newspaper...and he also wants to know about the hydro electric cell....Ok...OK yes..yes...he will be there in half an hour. Many thanks...Namaste.

Sound of the line being disconnected.

Dr. Sudha: So, Ananya...your work is done. Now reach Dr. Kotnala's lab quickly.

Dr. Sandip: Now don't just rush off...taste some of these pakoras.

The sound of Ananya's voice fades as if he is walking away. Ananya: Thank you, Uncle. You and Sudha aunty enjoy the pakoras...I'll have some when I return.

Laughter.

Scene change.

Knocking on a door.

Dr. Kotnala: Come in.

Ananya: Namaste ...I am Ananya...Dr. Sudha rang you ...

Dr. Kotnala: Come in... Come in...So, you are a journalist...Dr Sudha mentioned it...come take a seat...Ananya, this is my colleague Dr Jyoti. She contributed a lot to the development of the hyrdo electric cell.

Ananya: Namaste.

Dr. Jyoti: Namaste

Dr. Kotnala: Tea or coffee? What will you have?

Ananya: Sir, there is no need to order anything for me.

Dr. Kotnala: Who will bring tea or coffee at 7 Pm i.e. after office hours in an organization? We brew tea or coffee in our labs ourselves. Let's make three cups of coffee...

Ananya: As you please.

Dr. Kotnala: So, go on Ananya...fire away...what do you want to know?

Ananya: What is a hydro electric cell?

INFORMATION supplied by Dr. Kotnala

Dr. Kotnala: Dr. Jyoti has used it to run a few appliances.

INFORMATION by Dr. Jyoti on the appliances run using hydro electric cell

Ananya: Is the hydro electric cell a completely Indian invention?

INFORMATION supplied by Dr. Kotnala. Also includes difference between invention and innovation.

Ananya: What has been the total expenditure on making this hydro electric cell? From where did you source the raw materials?

INFORMATION on raw materials supplied by Dr. Jyoti.

INFORMATION on expenditure and capital influx from industrialists by Dr. Kotnala.

Ananya: (In tones of surprise) Such low capital expenditure and such a brilliant technology. Yet it is lying in the lab...why is this so? Does the market not trust Indian technology?

Dr. Kotnala: The answer is that many industrial houses have reposed their faith in this laboratory and soon, you should be seeing the product in the market.

Ananya: Dr. Kotnala, nano pores play an important role in this technology that uses water to make electricity. Is there any chance that these pores may get blocked? If yes, what work is being done keeping this issue in mind?

Dr. Kotnala responds. A lot of work focuses on the material being used. For example Lithium can be mixed and used for a longer period.

Anaya: I observed that just a touch of water activated the cell. Yet now that the water has dried up, the LED is still glowing!

Dr. Kotnala ANSWERS

Ananya: This technology seems ideally suited for use in tribal areas and in rural areas, but it has potential to be used in urban areas too. It can prove to be a major milestone in technologies developed. Just a touch of moisture activates the cell...can we use it in cars, buses, trucks etc...?

Dr. Kotnala ANSWERS

Dr. Jyoti ANSWERS

Ananya: I would like to take a few photograps. Please come this side Dr. Kotnala...and you too Dr. Jyoti...yes...yes just right...one minute.

Sounds of photos being clicked.

Annaya: Dr. Kotnala, Dr. Jyoti thank you both very, very much...and thanks too for this major technological breakthrough invention. I hope that your invention is utilized in every household pretty soon and people no longer get shocks when they see the electricity bills.

All laugh.

Music to indicate scene change.

Door bell rings.

Dr. Sandip: There you are Ananya. Sneha..your Mom has been calling me up...isn't your phone working?

Ananya: Oh! No. I was charging it at Dr. Kotnala's lab using his hydro electric cell and I left it behind.

Dr. Sudha: Yes, I know. Dr. Kotnala had called. You can collect your phone from his lab tomorrow. Now, come and have dinner with us. I have told your Mom.

Ananya: Great...I'll get a chance to meet Dr. Kotnala again, tomorrow.

Dr Sudha: What do you think about the hydro electric cell?

Ananya: It is spectacular...amazing...incredible! But imagine we invented such a marvel in India...we hold the patent too yet no one is thinking of a business module for it. But I am convinced this technology will usher in a revolution in the field of energy.

Dr Sandip: It is clear Ananya is very impressed with the hydroelectric cell...now the energy issues in rural areas will be solved, won't it? What do you think?

Ananya: Absolutely. As long as our scientists take interest and remain committed, I am certain we will find totally worthwhile and meaningful ways to resolve our problems. I loved the hydro electric cell.

Dr Sudha: Don't you love this potato curry made with lentil balls?

Ananya: Sure I do. I love potato curry cooked this way.

All laugh.