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ECG Pylons Effective use

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ABSTRACT
The Pylons used for the transmission network of the Electricity transport from the generation point to the distribution point can be optimized in that it can also be used for transportation; that is the electric train system. The Chinese Electric train systems have used this technology in which Pylons used for transmission of Electricity are used at the same time as a power supply to their electric train system.

The normal installation of these Pylons is a straight line or row along the boundaries of our road highway system. My suggestion to this high tech system is instead of the one long row system of the installation of the Pylons it has to be two rows or networks and a coupler placed between the two cables side by side of each of the Pylons will serve as a Power supply to the electric train running between the two rows of Pylons. In this case, the Pylons being a carrier ofelectricity will also act as a Power supply of electricity to our electric train system. This means as it solves our Power issues; it also solves our transportation issues.

Keywords
Pylons, Electric Train, Generation,Transmission, Distribution

1. INTRODUCTION

Figure 1 OVERHEAD TRANSMISSION

A new World Bank report released called for increased private sector investment in Africa's under-developed electricity transmission infrastructure, a vital ingredient for reaching Africa's energy goals.Africa lags the rest of the world when it comes to electricity, with just 35 percent of the population with access to power and a generation capacity of only 100GW. Those who do have power typically consume relatively little, face frequent outages and pay high prices. Transmission infrastructure is a crucial middle part of the electricity value chain. Alongside generation and distribution, improving and increasing transmission infrastructure is key to closing the access gap. So far, transmission in Africa has been financed from public sources and new models of financing involving the private sector have received insufficient attention from policymakers or financiers. The 'Linking up: Public-Private Partnerships in Power Transmission in Africa' report examines private sector-led investments in transmission globally and how this approach is applicable in sub-Saharan Africa. The private sector has participated successfully in transmission networks in many countries in Latin America and Asia, and this approach could be replicated."Private finance has supported the expansion of electricity transmission infrastructure in many regions of the world and the same can happen in Africa. To attract private sector investment, however, governments need to adopt policies supportive of this strategy and establish the right business, regulatory and legal environment to sustain investor interest," said Riccardo Puliti, Senior Director and head of Energy and Extractives Industries at the World Bank.Estimates of annual investments required from 2015-2040 to expand the transmission network range from $ 3.2 billion to $4.3 billion. These investments are critical to delivering cost-effective power to households and industries.The report examined independent powertransmission projects (IPTs) in five countries (Brazil, Chile, India, Peru and the Philippines) where major power sector reforms were undertaken to privatize the sector. For example, the use of privately financed ransmission lines in Brazil, Chile, Peru and India collectively raised over $24.5 billion of private investment between 1998 and 2015. This resulted in close to 100,000 km of new transmission lines.The study provides a set of recommendations for countries to adapt to specific local conditions and lists 10 steps to get there, including the right legal and regulatory framework, new models for concessional lending, competitive tender processes, adequate revenue flow and credit enhancement for projects, or tailored IPT projects to attract international investors, to name a few.

2. DESCRIPTION
Generally, an electrical transmission line is used For transmitting electricity to a destination and made of conductive metal such as copper and aluminium. There are various kinds of electrical transmission lines, among which an electrical transmission line installed on the ground and extending to a long distance should have high mechanical strength.Overhead transmission lines and electrical transmission lines for electric trains are such electrical transmission lines demanding high mechanical strength.The electrical transmission line for electric trains provides electricity to an electric train through a pantograph provided at the upper portion of theelectric train. This electrical transmission line for electric trains should have high conductivity since it supplies electricity to a moving electric train. Also, the electrical transmission line for electric trains should have high tensile strength and high abrasion resistance since it extends several ten kilometres or several hundred kilometres and suffers from the friction against the pantograph.Most electrical transmission lines for electric

trains available in the market are made of copper or aluminium material. However, an electrical transmission line made of copper or aluminium has low tensile strength and low abrasion resistance in spite of high conductivity, which causes a lot of maintenance costs. In other words, the electrical transmission line for electric trains made of copper or aluminium is easily worn out due to the friction against the pantograph or easily bends or warps due to the low tensile strength, which results in frequent exchange or repair. In particular, since copper is expensive, in a case where an electrical transmission line for electric trains is made of copper, a production cost of the electrical transmission line for electric trains is increased [1]. Meanwhile, an overhead transmission line is an electrical transmission line for transmitting the electricity produced at a power generator to a far-off destination or primary substation, and the overhead transmission line is supported by pylons on the ground. This overhead transmission line includes a plurality of conductor units that take a charge of the transmission of electricity and support the transmission line. The conductor units are generally made of pure aluminium or aluminium alloy and are coupled and fixed to an external supporting structure such as a pylon to keep the strength of the overhead transmission line. Also, the conductor units play a role of transmitting the electricity generated at a power generator to a destination. However, the conductor units may be not suitably coupled to a pylon due to their weak mechanical strength.In order to solve this problem, there has beenproposed an ACSR (Aluminium Cable Steel Reinforced) overhead transmission line in which acentral tension wire with strong mechanical strength is provided at the centre of conductor units [2]. The conductor units provided to the ACSR take a charge of the transmission of electricity and extend on the outer periphery of the central tension wire in a twisted pattern. Also, the central tension wire located at the centre portion of the overhead transmission line generally adopts a steel core or a steel wire with strong mechanical strength to play a role of keeping the strength of the electrical transmission line while supporting the electrical transmission line [3]. However, the central tension wire occupies 30% or more of the entire weight and greatly deteriorates the electrical transmission capacity. In other words, the central tension wire formed with a steel core or a steel wire increases the weight of the entire overhead transmission line and also increases the sectional area of the overhead transmission line, thereby deteriorating the electrical transmission capacity of the entire overhead transmission line.

3. SUMMARY

In particular, the electrical transmission line for electric trains according to the present invention keeps electric conductivity over 50% IACS (International Annealed Copper Standard), which ensures satisfactory transmission of electricity to an electric train [4].

In addition, the overhead transmission line according to the present invention includes conductor units or a central tension wire made of aluminium-carbon nanotube composite material, which increases a supporting force against a pylon and increases an entire electrical transmission capacity in comparison to conventional ASCR overhead transmission lines. Further, the overhead transmission line according to the present invention is more lightweight than conventional ASCR overhead transmission lines since the central tension wire is made of aluminium-carbon nanotube composite material that is more lightweight than steel cores or steel wires [5].

4. CONCLUSION

The Pylons being a carrier of electricity will also be a Power supply of electricity to our electric train system. It solves our Power issues and it also solves our transportation issues. This is in a way, an Optimization of the ECG (Electricity Company of Ghana) Networks Pylons Infrastructure Systems.

5. REFERENCES

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