

Background

In 2008 the founders of Darrox thoroughly investigated the development of teleoperator business and related commercial products. The annual energy consumption of recently introduced (by Nokia in 2007) generation of radio base stations (RBS) and resulting global consequences gave force to the development of Darrox products.

According to studies there were about 6 million RBS masts in the world in 2006. Each mast consumes 10 – 15 MWh energy per annum. New and innovative renewable energy solutions can remarkably reduce the energy consumption of both existing and becoming RBS masts. One key requirement for telecom networks is faultless operation also during electric power failures.

Continuous rise of operating costs simultaneously with lowering customer prices are the main challenges for mobile network operators in the industrial world. RBS-grid energy consumption represents 20–25% of the total operating costs. Energy price is rising. 3G and 4G mobile networks are being build aside existing 2G networks. Total energy consumption rises almost directly in relation to the number of parallel networks. Telecom operators face hard profitability challenges due to these trends.

The RBS-grid energy consumption could be drastically decreased, if each RBS mast would be equipped with applied wind turbine (together with solar panels). The solution enables also completely stand-alone off-grid RBSs. Simultaneously both operational reliability and overall lifespan of the mast can be remarkably increased. Furthermore, the solution has significant environmental consequence: If all RBS masts had a wind turbine, few large coal plants could be shut down.

According to Darrox market survey (2009) telecom operators' interest in energy saving solutions is remarkable. The price of electricity is anticipated to double in few years. As a major part of operator costs is bound with price of electricity, the equation is clear. If a Darrox product can produce 1/3 of annual energy consumption, the savings are significant. The product also perfectly fits with the current environmental values.

Another great challenge for the industrial world telecom operators is enhancement and securing mobile network reliability according to authority requirements and rules. Mobile network has become a commodity like water or electricity. It is expected to work always. Many businesses are also dependent on mobile networks. For these reasons the authorities have strained the reliability requirements for mobile networks. The operators have to build reserve power systems for power failure situations. Until now, the only alternative has been accumulators. Accumulators are expensive, have a short lifespan (5 years) and are hazardous for the environment.

Darrox wind turbine

The Darrox vertical axis wind turbine (VAWT) enables almost stand-alone energy production for each RBS. This facilitates a remarkable cost reduction for telecom operators, thus securing cost-efficient business.

Darrox VAWT replaces grid power input during electric breakdowns. This minimizes investment needs in accumulators for fulfilling the authority regulations. (This requires authority acceptance, the process for this is running.)

Darrox has focused on the issue since 2008 and has built pilot installations with Finnish telecom operators. We have been significantly enhancing our know-how via these pilot installations and have been able to clarify the needs of operators and other customers.

As a fine fruit of Finnish engineering the company introduced an efficient direct current system in the end of 2009. The solution comprises carbon-fiber double Darrieus wind rotor, advanced generator technology, single point mounting to the mast and integrated power unit (for charging accumulators) with on-line monitoring. Several patent applications have been filed.

The product has been engineered to completely fit the telecom operator needs. For example wind-load minimization enables assembly to almost any RBS mast. Due to its high efficiency the product is also applicable to the low wind speeds of the Nordic Countries. There are almost 25,000 RBS masts in the Nordic Countries. On the other hand the company approximates the third world installations being the largest growth potential.

Solar panels are expensive to purchase and maintain and have inadequately power to operate alone. Therefore Darrox has developed also a cost-efficient hybrid solution combining the benefits of wind

turbine with solar panels. Furthermore, Darrox VAWT can be coupled with other renewable energy sources. In this way the usage of diesel generator back-up systems can be drastically reduced, even eliminated.

Our clear mission is to cleverly export Finnish know-how!

Further information:

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