EURELECTRIC’s views on the use of creosote for impregnation of wooden poles in electricity networks

**Summary:**

- Creosote and creosoted wood can be and are used in a safe way, exposure is limited and occupational risks can be well controlled.
- To date, no alternative effective wood preservatives are available for these heavy duty applications.
- The exposure of workers is negligible since they wear gloves, overalls, barrier creams and facial visors when working on, with or drilling the poles and no adverse health effects have been reported in our experience to date.
- Wooden poles are easy to work with.
- Wood is a very light material compared to competing materials such as composites, concrete and steel that cannot, therefore, be used in some geographical locations.
- The use of wooden poles is requested by competent authorities in certain areas
- Wood poles are less expensive than steel and concrete: in material cost, transportation, erection, installation, modifications on site, maintenance and total life-cycle cost.
- Wooden creosoted poles can easily be recycled by controlled incineration which can be used to produce electricity and/or heat.
- Prohibiting the use of creosote would have highly adverse financial and operational impacts for electricity and telecommunication companies and industries in the European Union.
- The prohibition of creosote poles would have a negative impact on the reliability of electricity transmission and distribution and on the costs of electricity transmission and distribution, especially in rural areas.
- Wooden creosote poles blend in well with the environment contrary to concrete and steel structures.

⇒ **EURELECTRIC stresses that with regard to all appropriate health, economic, technical and environmental aspects, creosote is an effective impregnating agent. The use of creosoted wood poles is the most economic of all structures currently available to utilities and has the least impact on the environment. Creosote should therefore remain a substance for wood preservation products, and, in particular, for transmission and distribution poles.**
**Introduction**

Under the programme to review Active Substances in Biocidal Products, pursuant to Council Directive 98/8/EC, the European Commission and national authorities are currently evaluating the possible inclusion of creosote, the most common wood preservative in use today, in Annex I of the above mentioned Directive.

EURELECTRIC, representing the European Electricity Industry and its members, participated in the consultation organized by the Commission in 2008, and would like to repeat its support for the continued authorized use of creosote to treat wooden poles in electricity networks. We would like to express our deep concern over potential measures which would ban the use of creosote for transmission and distribution poles.

In order to modernise the EU power grid for it to become more flexible, major investment will be required in the near future. Grid flexibility is required to integrate a variety of renewable sources as power generation becomes more decentralised. A more modern flexible grid will incorporate new energy demand technologies, and be capable of meeting new demand patterns. Projected investments by 2030 are estimated at about € 490 billion\(^1\) in the European Union. There are currently millions of creosote wooden poles installed on the electricity and telecom networks in Europe. Furthermore, there are currently millions of creosote poles stored throughout the EU by various utilities which will be used on the electricity and telecom networks over the next few years. Therefore, the implications of an EU ruling, which would preclude the use of such poles, would have a significant negative impact on the European Electricity and Telecommunications Industries. It would give rise to significantly higher costs (capital and operating), in achieving the current level of safety (staff and public) and network reliability. The contingent replacing of creosote treated wooden poles from European Networks would cost billions of euros to the European Electricity Industry and to its customers.

EURELECTRIC would like to re-iterate a number of important aspects regarding creosote as a wood preservative and creosoted wooden poles. The many fundamental benefits of creosote as a wood preservative far outweigh the risks associated with its use. Those possible risks can also be significantly minimised by well established control measures as are currently used by the various utilities.

**Key facts about creosote use**

Creosote, a distillate from pure coal tar, is the oldest wood preservative type on the market and has been in use for more than 150 years. According to estimates, about 1 million cubic metres of wood is treated with creosote each year in Europe. Erected wood poles impregnated with creosote in accordance with EN 13991 and BS 144: 1997 have a life span of between 40 to 80 years, dependent on latitude, altitude and climate conditions etc.

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\(^1\) Projected investment in power infrastructure in the IEA World Energy Outlook 2009 – Reference Scenario to 2030
One of the most common applications is to use creosote wooden poles in overhead power and telecommunication lines. The impregnation industry has for over 60 years been producing creosote poles according to industry guidelines and national standards, so-called WEI specifications. These industry guidelines have meanwhile been adopted by the European Committee for Standardisation (CEN) and have become a CEN Standard (EN 13991). This standard takes into account European legislation adopted to regulate the use of creosote and creosoted wood (e.g. in Directive 2001/90/EC). This Directive foresees that creosote may be used for wood treatment in industrial installations only for limited use, and its use is permitted by professionals only. The use of impregnated wooden poles is accepted by the Directive.

**The use and need of creosote wooden poles in distribution networks**

The use of wooden poles in distribution networks has kept its position within electricity networks due to a high safety level and long service life, which is reached through effective protection against decay. Requirements for effective protection against decay are determined by a number of factors of which climate plays a major part. A reliable supply of electricity is also of vital importance, especially in thinly populated areas. Furthermore, the use of wooden poles is sometimes required by competent authorities in certain areas (e.g.: natural parks or reserves).

The fact is that creosote remains in wooden poles for a long time. The reason is its oily and viscous nature and hydro-repelling quality. As a consequence, leaching creosote to the environment is reduced to a minimum.

**Alternatives to creosote wooden poles**

It is internationally acknowledged that there are no other appropriate products for application to treated wood in ground contact where long service life is needed. The service life of wooden poles impregnated with creosote is about 40 - 80 years, according to European and international *in situ* experience.

Copper based impregnation methods have been in use for only a few years, and therefore experience in this respect is minimal. Their effectiveness will vary according to local conditions. Expectations for their service life are significantly lower in comparison to creosote impregnated poles. To date, creosoted poles are the *only* alternative which can guarantee that no corrosion or other unexpected events occur to metal parts in contact with wood. This point is of great importance with regard to human safety.

There are, in theory, substitute products available, such as composite, concrete and steel poles. In practice, such products are not yet available in many of the national markets in Member States. Wood is a very light material and has therefore numerous advantages over the competing materials, such as concrete and steel. Wood poles have lower transportation and storage costs. When stacked properly, wood poles need less storage space than steel or concrete poles. In addition, wood withstands handling and surface damage better than steel poles - the galvanized surface of a steel pole is very thin and can be easily damaged. These points contribute to a greater safety performance of wood poles over steel and concrete, not to mention the environmental advantages created by lower production and transportation costs, etc...
Furthermore, wood products have different mechanical properties than concrete or steel poles that are advantageous, e.g. they are more flexible which allows their use in applications not possible for competing materials. Because of their flexibility, wooden poles are more resistant to breaking.

Wood poles are also easy to install directly into the ground, whereas steel poles may need in some cases a special concrete foundation and expensive collars or flanges to prevent corrosion. Steel poles have to be hoisted by cranes to foundations. Moreover, concrete poles are also heavier and need larger cranes for hoisting.

Steel poles must be electrically earthed, which is not necessary for wood poles since they do not conduct electricity. This is an undeniable safety advantage for wooden poles. It is easy to fabricate wooden poles according to customer’s requirements for markings and pre-drilling. Steel and concrete poles require special attachments for accessories, but no special tools are needed for wood poles. Installation is made simply by screws or bolts. Even “A” and “H” designs are easily constructed on site and climbing is easy for linesmen.

Wood has good insulating properties and is therefore safer than steel or concrete. Wood can also quench flashovers and power arcs commonly caused by lightning.

**Health impacts to workers**

Based on the very broad data base, the Swedish Chemical Inspectorate, KEMI, in the framework of their work under the Biocidal Products Directive, stated that “[however], the body of epidemiological data does not indicate an apparent elevated cancer risk for creosote workers.” They concluded that a safe use of creosote is possible in industrial applications and suggested the inclusion of creosote into Annex I of Directive 98/8/EC.

European distribution and network construction companies are very professional and work to very high standards. National energy associations and authorities have drawn up clear safety guidelines for working with creosote poles. Guidelines include detailed rules about treatment of creosote wood and use of personal safety devices when needed. Workers are obliged to wear protective clothing and gloves to avoid any direct skin contact. Also workers have respiratory protective equipments when handling creosote wood with tools.

No specific risks have been identified for the health of the installation staff in network construction companies. Today’s creosote B and C oils are considerably less harmful than those used in past decades. Because no health implications were found even during the use of those old oils, it can be supposed that now when using the “environmentally friendly” oils we have also clearly gained some margin in this safety issue.

**Environmental aspects**

Wood is an extraordinary material. It is naturally renewable and it grows in ever increasing abundance. The use of wood creates an ecologically managed resource and a simple way to reduce CO₂ emissions that are the main cause of climate change.
Wood poles have a service life of 40 – 80 years, depending on the item and climatic conditions on site. Steel poles’ service life is 35 - 50 years and is heavily affected by corrosion. Similarly, the service life of concrete poles is heavily dependent on climate erosion and the quality of the concrete. Energy need during life time for creosoted wood is much lower than the competing materials such as concrete, steel or plastic. Wooden poles are easy to remove and re-use, whereas steel poles may be re-used only after a treatment in a workshop. Re-use of concrete poles is even more complicated. The production of cement and steel is a significant source of GHG emissions.

Creosoted wood can also be recycled easily, especially through incineration for the production of heat and/or electricity. As creosote can also be considered a coal tar fuel oil, creosoted wood provides a high calorific value and does not leave any toxic residues. It also contributes to closing the CO₂ circle as wood is a CO₂ neutral material.
Annex: examples of national situations

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<th>Austria:</th>
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<td>• Some DSOs have more than 50,000 creosote treated wooden poles in their distribution grid, especially in rural and alpine areas</td>
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<td>• Some DSOs are renewing about 800 poles per year with creosote treated poles</td>
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<th>Czech Republic:</th>
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<td>• Creosote treated wooden poles is the favourite option (elasticity and resilience of wood, lifetime of creosote treated wood)</td>
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<td>• Wooden poles are used on concrete bases in specific areas (risk of flooding, instable grounds, swamps)</td>
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<td>• The use of wooden poles is prescribed by competent authorities in certain areas</td>
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<td>• 100% of overhead distribution networks’ poles are creosote impregnated wooden poles</td>
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<td>• About 240,000 wooden poles installed in the Cyprus Electricity Distribution Networks</td>
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<td>• Every year, about 20,000 new creosote impregnated wooden poles are installed in the Overhead Distribution Networks, for new lines or for replacement of damaged or broken poles</td>
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<td>• Estimated cost of replacement of creosote impregnated poles: € 106 million (excluding revenue losses due to the inability of offering services during the substitution period)</td>
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<th>Denmark:</th>
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<td>• Creosote wood poles for 50kV and above are maintained and replaced by new ones when necessary</td>
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<th>Finland:</th>
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<td>• Altogether, there are more than 10 million wooden poles in the electric and telecom networks in Finland</td>
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<td>• Each year about 100,000 new wooden poles are installed in the distribution networks, either in new lines or for replacement of damaged or rotten poles</td>
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<td>• Although in Helsinki the vast majority of electricity transmission and distribution lines are underground cables, wooden poles are the most common solution in the Finnish countryside</td>
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2 The below information are not exhaustive and are only some examples of situations across Europe.
### France:
- Out of 15,000 wooden poles installed each year, 30% are treated with creosote (source: ERDF). Other DSOs still using wooden poles (in particular in rural areas)
- A number of local authorities request the use of wooden poles

### Greece:
- About 90% of overhead distribution networks’ poles are creosote impregnated wooden poles
- About 4.5 million wooden poles installed in the Greek Electricity Distribution Networks
- Every year, about 80,000 – 90,000 new creosote impregnated wooden poles are installed in the Distribution Networks, in new lines or for replacement of damaged poles
- Estimated cost of replacement of creosote impregnated poles: € 3 billion (excluding revenue losses due to the inability of offering services during the substitution period)

### Ireland:
- About 99% of overhead transmission and distribution networks’ poles are creosote impregnated wooden poles
- Some 1.8 million wooden poles are currently installed on the transmission and distribution networks
- About 40,000 new creosote impregnated wooden poles are installed per annum on the transmission and distribution networks to cater for maintenance, refurbishment and new works
- Assuming a replacement rate of 45,000 poles per annum over a 40 year period and a like for like replacement cost the estimated present day direct cost of their replacement is about €1.8 billion. It is important to note that this figure excludes the very considerable cost of measures to maintain supply as far as possible (e.g. rental of generators) and penalty charges where supply must be interrupted and/or can not be maintained

### Norway:
- The total number of wooden poles used in Norway for electricity and telecommunication services is estimated at 3.5 million. Some of these poles are salt impregnated, but the majority of wooden poles used is creosote impregnated
- About 30,000 creosote impregnated wooden poles sold on the Norwegian market in 2009
Spain:
- There is a high number of creosote wooden poles in the distribution networks
- Creosote wooden poles are used by some companies to replace damaged or rotten poles when necessary
- In some specific cases, competent authorities require the use of wooden poles

Sweden:
- Every year about 5,000 poles are replaced and 9,000 new poles are erected for new overhead power lines
- The additional expenditure for concrete poles in relation to wooden poles would give rise to an annual increase of around €8 – 11 million
Source: EON Elnät Sverige AB
- The number of creosote poles in Vattenfall Eldistribution AB is around 750,000
- Every year about 15,000 poles are replaced
- Additional costs for an alternative are approximately 10% more expensive
Source: Vattenfall Eldistribution AB

United Kingdom:
- Large percentage of the existing wood pole population situated in rural and remote areas not suitable or accessible for concrete or steel poles
- Concrete and steel types are more prone to earthing faults and a resulting increase in number of outages