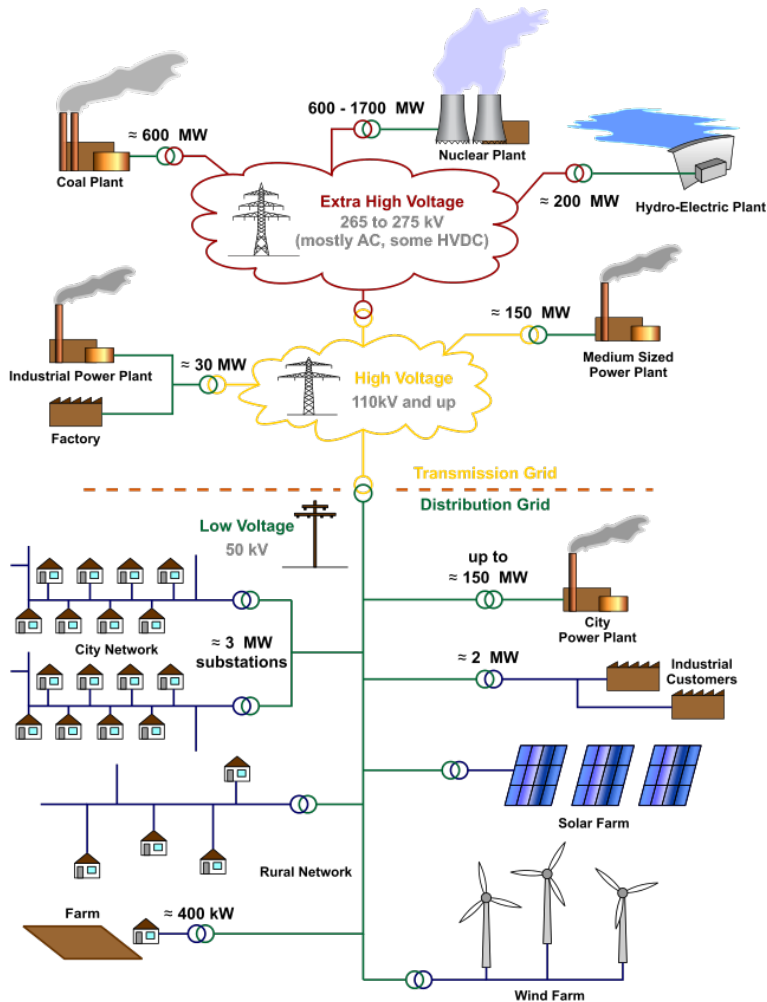


Innovation for safer, sustainable electricity networks  
**HedgeHog: A revolutionary strong current joint**



# Strong current joints today

## Unsafe, costly, cause energy loss

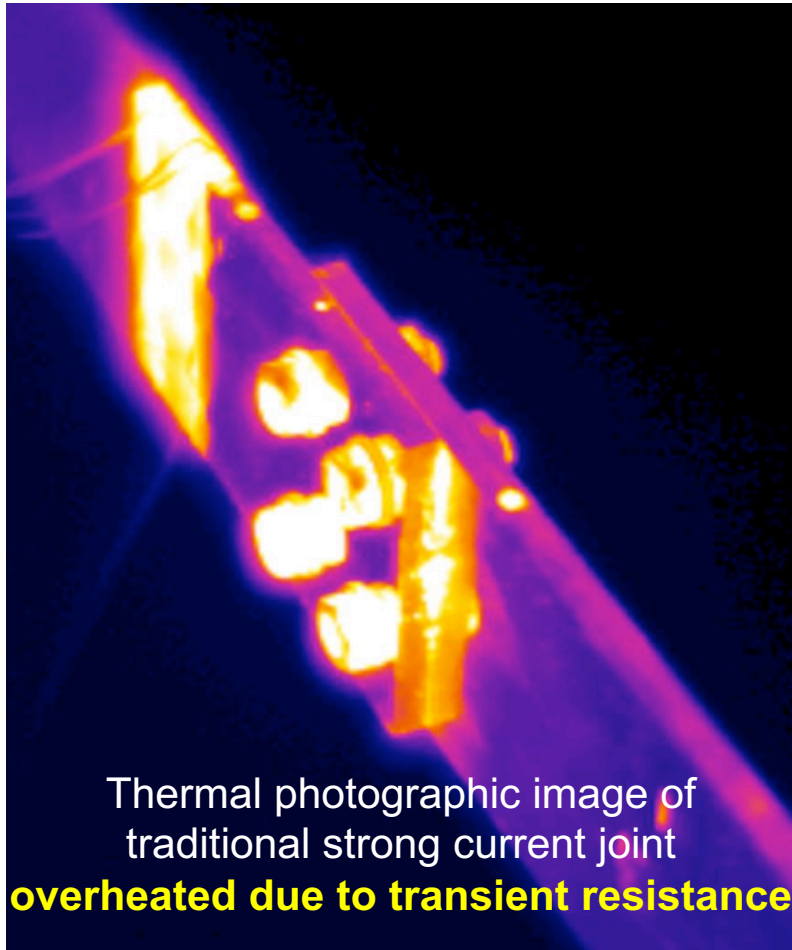


1. High rate of failure despite regular maintenance efforts
2. Constant safety risk e.g. electrical fire caused by overheating
3. Source of up to 1% of all network dissipation

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# Strong current joints today

## Inherent problems, yet global standard



1. **Loosening of joints** due to varying thermal expansion of different metal parts
2. **Continuous weakening of joints** due to galvanic voltage generated by humidity between the differently polarised metal parts
3. **Drift current and hysteresis** produced on steel bolts
4. **Ohmic resistance** results in overheating

### **Transient resistance causes**

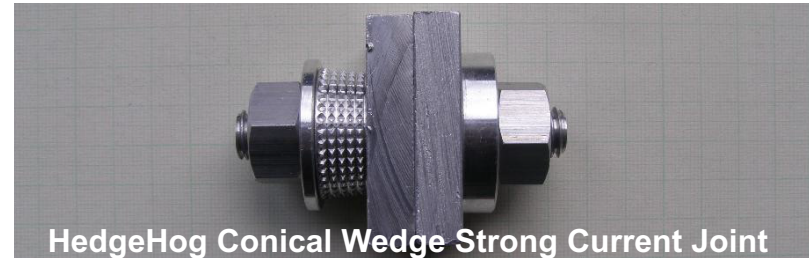
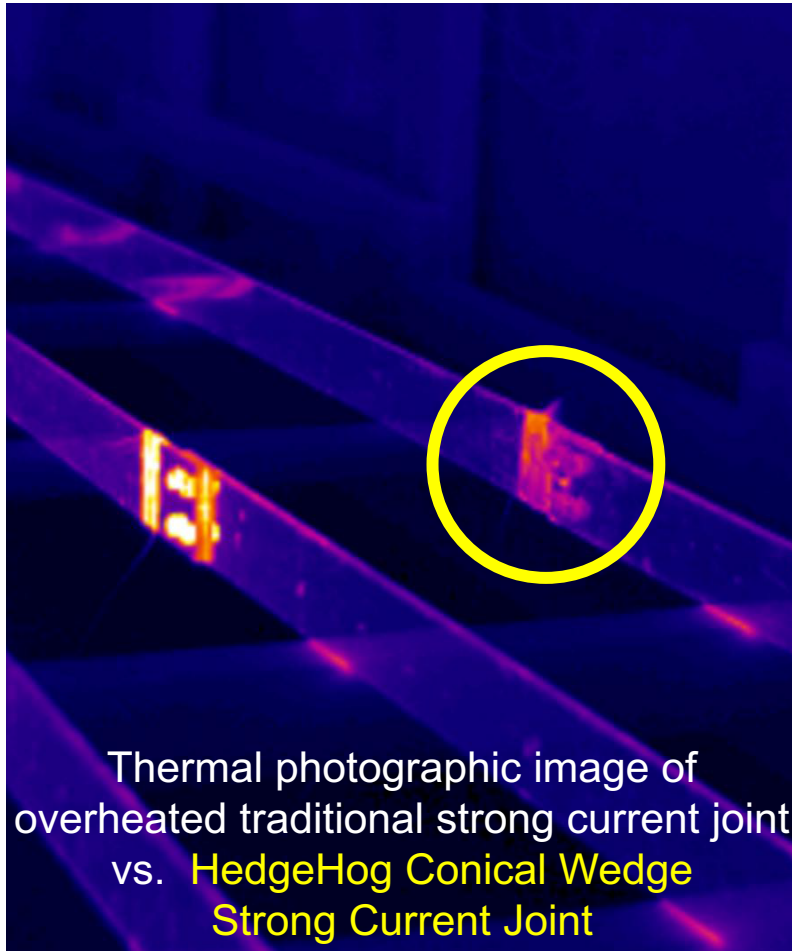
- Network failures
- Shutdowns
- Electrical fires

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# The HedgeHog Conical Wedge Strong Current Joint

Revolutionary, safe, sustainable

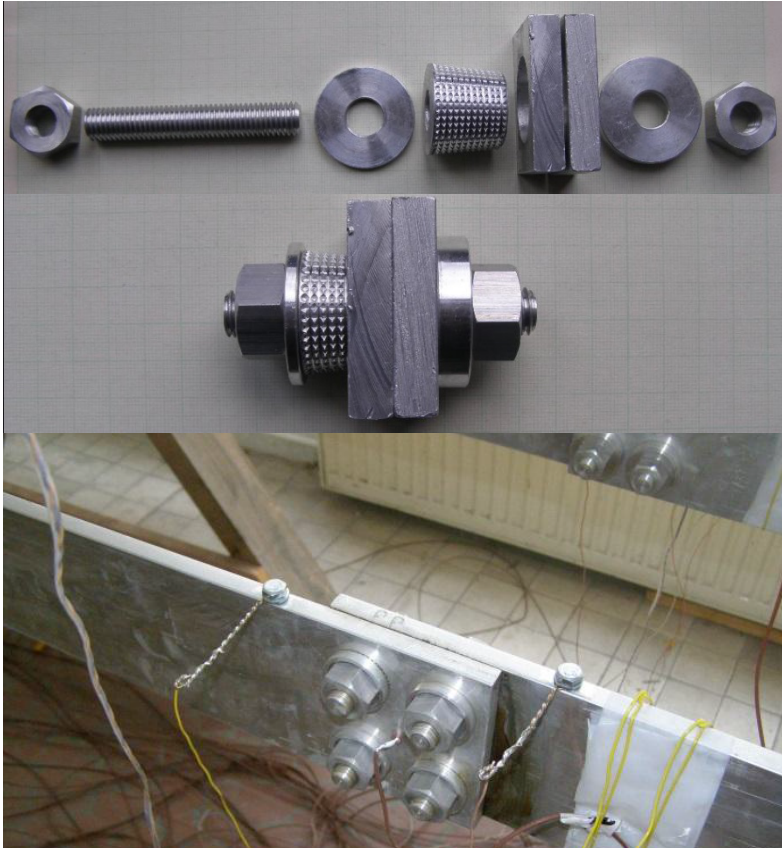


1. Significantly improves performance by reducing transient resistance:
  - Safe
  - Reliable
  - Does not require regular maintenance
2. Eliminates network losses
3. Improves efficiency, thus profitability

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# The HedgeHog Conical Wedge Strong Current Joint

## Solves inherent problems of traditional joint



HedgeHog Conical Wedge Strong Current Joint  
with increased conductive surface

1. Eliminates loosening of joints thanks to conical wedge structure
2. Eliminates weakening of joints because of improved conductive surface of components
3. Decreases resultant resistance not only compared with traditional joints but **shows better results than reference rail without any joints**

### Decreased transient resistance:

- Improved performance & safety
- Better operational efficiency
- Higher profitability

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# The HedgeHog Conical Wedge Strong Current Joint

## The value of safe operations – without the on-going cost



A pharmaceutical plant in Debrecen, Hungary currently faces an **annual safety inspection cost of EUR 10,000** for thermal imaging alone.

On average **once a year**, plans have to be made for a **necessary cease of operations (factory shut-down)** leading to **debilitating production losses** – and all of this because of far-from ideal traditional strong current joints.

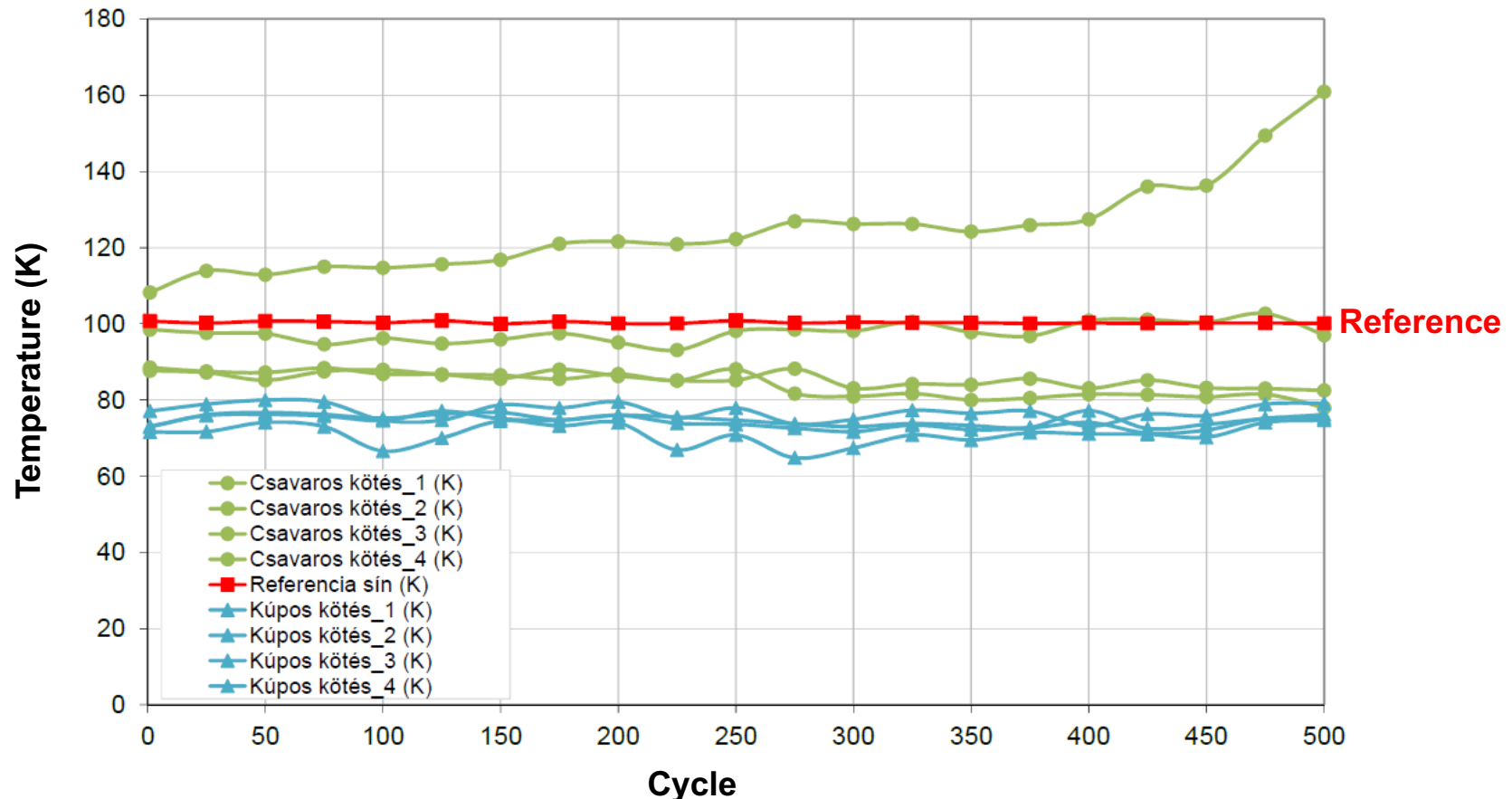
**None of this is necessary with HedgeHog Conical Wedge Strong Current Joint**

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# The HedgeHog Conical Wedge Strong Current Joint

## Superiority proven by electrical regulatory authority

Temperature: **HedgeHog** vs. **Traditional** strong current joints



Study conducted in 2014 by VEIKI-VNL Electric Large Laboratories Ltd. Study identifier: NAL-10/2013

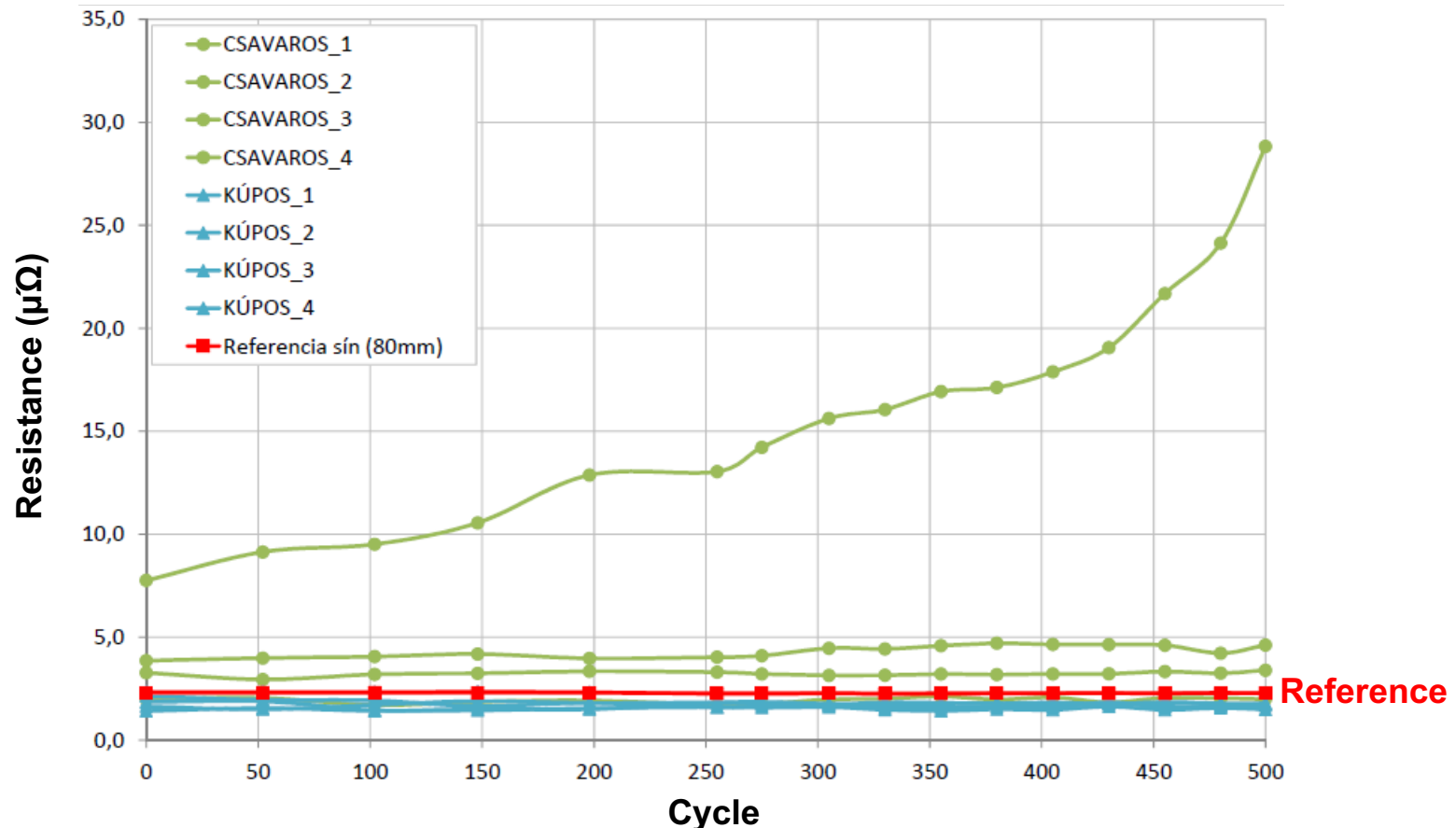
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# The HedgeHog Conical Wedge Strong Current Joint

## Superiority proven by electrical regulatory authority

Resistance: **HedgeHog** vs. **Traditional** strong current joints



Study conducted in 2014 by VEIKI-VNL Electric Large Laboratories Ltd. Study identifier: NAL-10/2013

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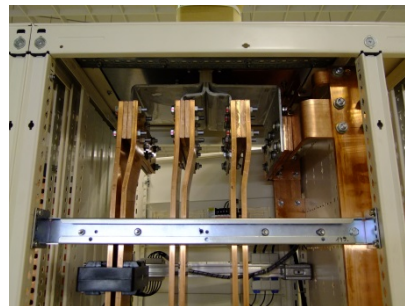
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# The HedgeHog Conical Wedge Strong Current Joint

## Target markets

All high-powered devices used in step-up/step-down transmission or distribution substations and in any transmission and distribution systems, e.g. circuit breakers and other switches, insulators etc.

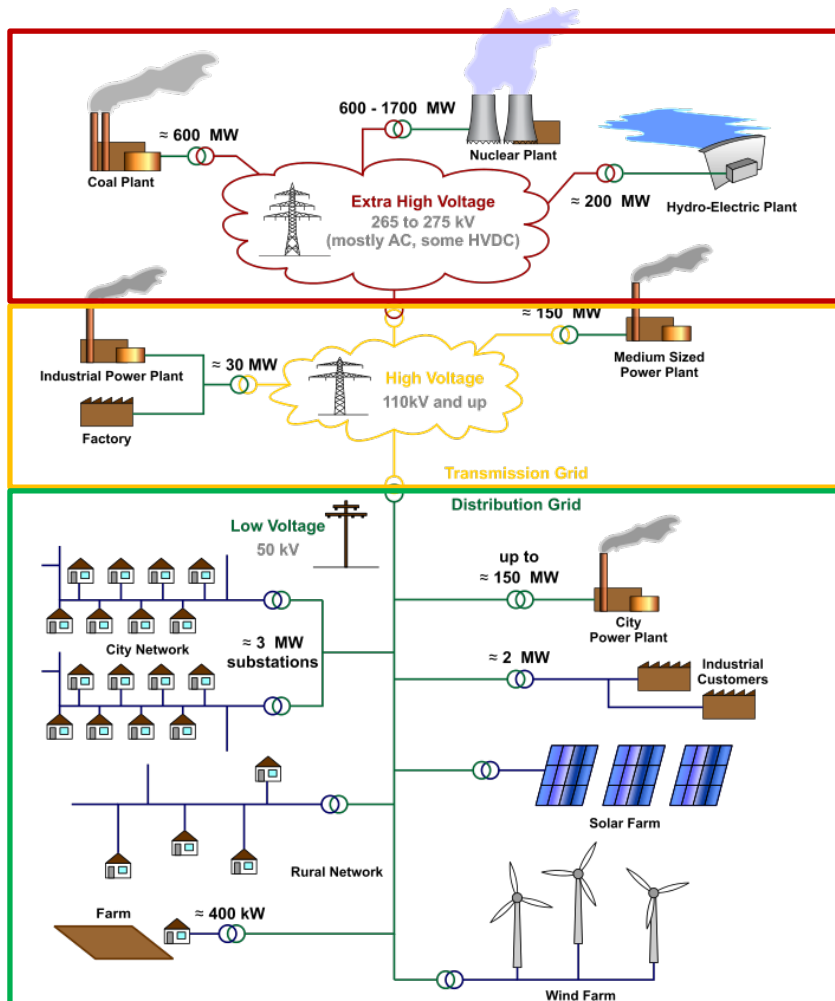


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# The HedgeHog Conical Wedge Strong Current Joint

## Top-line market overview - Hungary



30 substations –  
approximately 50k joints

200 substations –  
approximately 300k joints

52,000 substations –  
approximately 2 million joints

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# The HedgeHog Conical Wedge Strong Current Joint Investment – Innovation Project

- Estimated EUR 3,000,000 covering:
  - Target-market specific research and development including
    - Identification of product ranges and families to the specific sales segments
    - R&D facility set-up
    - Intellectual Property Rights
    - Installation
    - Certification
    - Potentially standardisation
  - Development of training methods/materials/channels
  - TÜV or local regulatory processes/certification (e.g. US)
  - Examination and certification of materials used in joints (i.e. physical characteristics and properties)
  - Mass production capabilities & equipment

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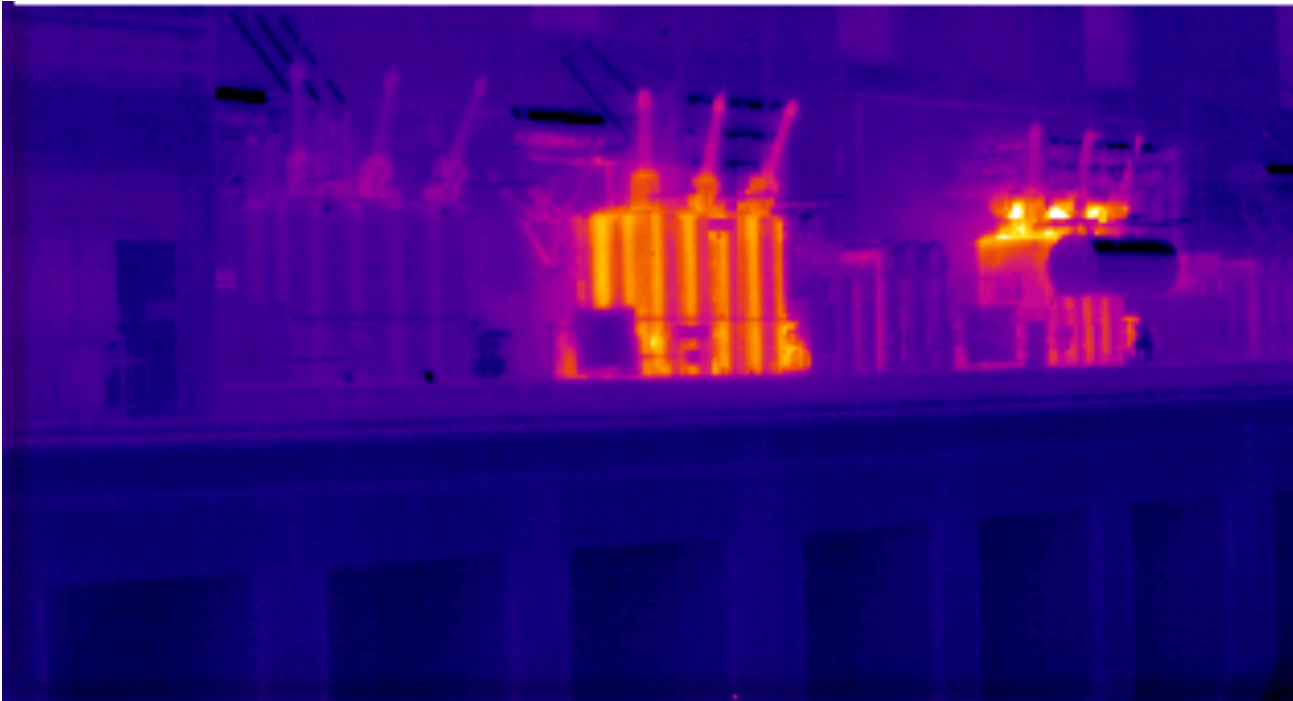
# The HedgeHog Conical Wedge Strong Current Joint Summary

- World-first solution for a safer, sustainable and profitable strong current joint
- Superiority proven by foremost electrical regulatory authority
- Mass production possibilities verified
- Patents acquired to date
  - PO800510 (Hungary)
  - EP09785722 (EU)
  - 13/058528 (US)

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**Thank you.**  
Questions?



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