

## THÈME: 05. APPROCHES OPÉRATIONNELLES, ÉQUIPEMENTS ET MATÉRIAUX POUR LE SERVICE HIVERNAL

**SOUS-THÈME:** Méthodes de fonte de la neige

**Séance:** 07/02/2014 ( 08:30 - 10:00 h )      **Affiche:** 05/02/2014 ( 09:30 - 12:30 h )

**Salle:** C

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#### Titre de la présentation:

ÉNERGIE GÉOTHERMIQUE POUR CHAUFFER LES SURFACES DES RUES EN HIVER

#### Resumé (anglais):

Adverse road surface conditions in winter times lead to restrictions in capacity as well as decrease of traffic safety. The aim of road authorities is to avoid adverse road surface conditions by winter maintenance with ploughing and salting technique or at least to clear the road surface very quickly. It is not possible respectively not reasonable, to carry out winter maintenance operations everywhere at the same time. In consequence of different microclimatic conditions some road sections, e.g. on bridges as well as on dams or in shadowy areas, become icy earlier than the rest of the road network. In addition in some road sections the consequences of adverse road surface conditions, e.g. at high grades or at intersections, are more severe than in the rest of the road network. To deal with these circumstances, the usual winter maintenance can be assisted with automated technologies. E.g. with fixed automated spray technology prompt de-icing is better applied. Another alternative is heating of road surfaces with geothermal energy, which usually includes the possibility of cooling the surface in summer time. Based on the experience of worldwide existing facilities, additional collection of economic and traffic related data plus laboratory tests with road construction materials a variation calculus was performed. A consequent segmentation of the variation calculus in micro models to describe each influence respectively component and a macro model to determine the economic and ecological impacts allows a very wide inspection of the potential of geothermal energy as a contribution in winter maintenance. Using the input values observed in reality the results show a very wide distribution. From this it follows that there is no fundamental statement concerning the potential of geothermal energy as a contribution in winter maintenance. In fact a very detailed investigation of the individual case is still needed. In a network wide assessment the use of geothermal energy seems to be an option, if there are several dangerous road sections to be equipped, but each of them with small surface areas. On one hand there must be several dangerous road sections in the network that need a preventive winter service operation, and, on the other hand, these road sections must be definable by the climatic condition in such a way, that by instrumentation with geothermal energy no preventive operations are needed any more.



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