APPLICATION FORM

Valid for Call 1 'Calls for Ideas'

31st May 2014

CHEST

Valid for Call 1 'Call for Ideas' of the CHEST project, which is supported by the **Seventh Framework programme of the European Commission**

Categories of societal challenges	Select the category(s) that best describes the societal challenge. Knowledge Society and Education Social Inclusion, Human Rights and Equality Civic Empowerment and Community Engagement Environment and Sustainability **X** Health and Demographic Change Economic Empowerment and Prosperity **X** Other If 'Other', please describe (max 100 characters) **Safety and Civic Duty**: alerting drowsy drivers enables them to act responsibly by taking a break. (97)
Categories of digital solutions	Select the category(s) that best describes the digital aspect of the project. Social Software Open Source **X** Physical Computing Geolocation Web/Internet **X** Audiovisual **X** Data **X** Mobile Other

Idea title (max 50 characters)	Fit for task – driver alert (10)
Idea outline (max 250 characters). This will be public.	This system alerts a driver 2-3 seconds BEFORE physically nodding off behind the wheel. To prevent accidents due to fatigue, npk design develops a headband measuring brain activity. The device diagnoses and warns on lack-of-alertness and drowsiness. (246)
Idea Image (optional)	
Challenge Description (max 800 characters)	The problem is that current detectors are motion activated, but the moment a driver starts 'nodding' or (not) even closes his eyes, is too late. Every holiday season, society is shaken up by news of horrific crashes. Touring cars veer of the road, or trucks plough into traffic jams packed with families. Mostly, these accidents are caused by a split second of inattention or fatigue from drivers involved. The American Automobile Association estimates 16.5% of deadly car-accidents are due to drowsy driving. Fatigue also plays a role in accidents and near-misses involving pilots, crane-operators and surgeons as well. Studies show that one single night of poor or disrupted sleep causes potentially lethal lapses in concentration. An early warning system would thus be of great societal benefit. (798)
Solution Description (max 800 characters)	Commonly, to detect brain activity an EEG is measured by using 20 sensors with wet gel between the skin and the electrodes to ensure conductivity. Recent studies by University Medical Centre Utrecht demonstrated that drowsiness and delirium can be detected by as few as two electrodes in a frontal-parietal derivation. Meanwhile NPK Design holds proprietary technology capable of replacing the gel. Combined, these solutions turn the device in a wearable sensor, with only 2-4 dry electrodes, without gel, which can conveniently be used. A

	miniaturised processing unit in the headband or base-ball cap will continuously analyse the EEG-signal and, when lack of fitness is detected, send an auditory alarm signal to either speakers or phone to warn the driver or operator. (800)
Target group and social impact (max 800 characters)	Primarily the device will be tailored to bus and truck drivers. A second group that benefits are inexperienced car drivers (suddenly driving long distance to their holiday destination) and people having to drive late at night (when their bio-clock is set to "sleep"). It is important to realise, for these target groups the device should be inconspicuous in design and should fit in a simple baseball cap or hairband. Crane operators have caused costly accidents and, if successful, the concept can be expanded to airline pilots, surgeons, or any other activity requiring constant mental alertness. The social benefit is enormous, both by creating awareness in people of their own fatigue-level, allowing them to stop and rest responsibly; and by physically preventing these accidents from happening. (800)
Competences of the applicant (max 400 characters)	NPK design is an international design agency. The team has decades of experience in developing safety solutions from child car seats and hospital beds to medication adherence systems (Pico™), evacuation systems and many others. NPK offers the development of new product-service combinations and has in-house capacities to generate functional models and prototypes for testing. (382)
Video Link (optional)	

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How did you hear about the CHEST Competition?	Via the "Subsidieflits", the weekly electronic brochure from PNO