

## **Prevention-through-design for nanomaterials innovation processes**

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Nanotechnologies could play an important role in the energy sector, because they can be applied in the enhancement of the efficiency of conventional energy sources as in low-emission and renewable alternatives. The growing development of nanotechnologies and the widespread use of nanomaterials call for a responsible approach to evaluate and prevent health and safety (H&S) concerns related to such promising new technologies. Since many uncertainties still remain about health effects and as long as exposure limits will be available to conduct tailored risk analysis, the implementation of a preventive approach has been recommended. In this view the Italian Workers Compensation Authority (INAIL) developed a Prevention-through-Design (PtD) model to promote the practice of anticipating and “designing out” health hazards and risks associated with new processes, materials, structures, equipment or tools in the workplace. As companies adopt PtD approach, implementing hazard control measures higher in the hierarchy of controls, their business value may increase. Consequently, the possibility to minimize the potential for worker injuries and illnesses allows to mitigate the costs associated with them, and to increase the profits through the improvement of work processes and work organization. Such approach has been successfully applied to case studies of graphene and other semiconductor materials productions with promising application in an industrial scale-up of such innovation processes.