# Advanced water and air quality sensing through 2D nanomaterials for smart appliances and smart homes

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Abstract

Home appliances are evolving towards integrated, smart equipment able to exchange information with the surrounding environment. To fully enable this vision, distributed, intelligent and accessible sensing technologies are necessary.  Nanotechnology represents a promising tool to reach the cost-performance trade-off, as it allows to realize inexpensive and effective sensing elements. Moreover, nano-sized sensors require minute amounts of power, making them compatible with portable applications. As they can be used to explore and characterize the environment around home appliances, they allow to optimize performances in terms of water usage, energy consumption, food spoilage monitoring, and other consumer-relevant environmental parameters, with a sizeable impact on user perception and on sustainability.  Here we will report about progresses in the field of nanostructured sensors for water and air quality in the view of possible applications in the home appliance industry. Opportunities offered by the use of nanostructured materials to make sensing devices have been explored for the sensing of volatile organic compounds in air and of organic and inorganic contaminants in water.  Dedicated measurements setups have been created so to emulate real working conditions. The developed nanostructured sensors showed good repeatability over the time, as well as sensitivity towards the targets of interest. Nanostructured sensors for water and air quality characterization are a promising technology for achieving the objective of smart, integrated home appliances at acceptable costs for the user.

## References

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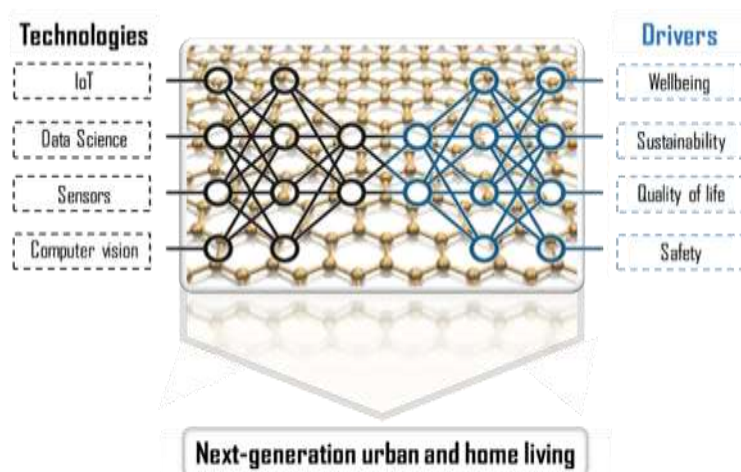
## Figures



**Figure 1:** Development drivers vs. technologies for next-generation urban and home living.