As the age of cheap oil and fossil fuels is coming to an end, we are facing an energy crisis. Many alternative energy sources have already been identified. However, there is no optimal solution to replace fossil fuels on a short time scale with new technologies that are economically viable and environmentally sustainable in the long term: we are confronted with a trilemma, at the nexus of energy, environment and economics. History reports disastrous consequences for human societies that exploited their resources in a non-sustainable way1, and arguably this is exactly what has been happening on a global scale for the past 250 years. Evidence for climate change caused by human activity is overwhelming. This public lecture aims at describing a general picture of the looming energy crisis, particularly to promote awareness2. Some possible solutions are discussed, involving the use of advanced technologies for energy saving, energy storage and energy conversion.


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