In the face of dynamic changes in our world, society is increasingly recognizing the importance of addressing environmental and public health issues. This awareness extends to chemical synthesis, a field that may seem distant to the average citizen, yet it is closely connected to our daily lives, providing the materials and products we use every day.

Many of these materials are derived from organometalloidal compounds, particularly organosilicon compounds. From rubbers and sealants to car waxes, as a society, we are introducing more and more of these compounds into the environment. In the past, the emphasis was more on the end result than on the synthesis process itself. The production of these compounds often relies on the use of expensive and rare precious metals, such as platinum, which are also highly toxic. In the case of rubber synthesis, some platinum-based catalyst remains in the final product, leading to negative economic and environmental impacts. Platinum compounds can cause, among other things, hair loss, asthma, and even increase the risk of miscarriages. In response to these concerns, a new policy has been developed, focusing on sustainable chemical synthesis, supported by both national and European institutions. The key principle of this policy is to use widely available, less toxic, and more affordable resources.

The project **"Implementation of Sustainable Sustainable Chemical Synthesis: Harnessing the Power of 3d-Electron Metal Compounds"** aligns perfectly with this trend toward sustainable development. Its main goal is to develop new synthesis methods based on widely available metals, such as iron. As part of the project, which is seeking funding, a wide range of 3d-electron metal coordination compounds containing NNN-type pincer ligands will be synthesized. These complexes will enable the creation of organometalloidal compounds that combine organic and inorganic elements into a unique, hybrid structure with distinctive properties. The project also includes the exploration of less conventional catalytic methods, such as electrocatalysis and photocatalysis, also utilizing widely available metals.

The expected outcomes of the project include obtaining a series of 3d-electron metal complexes with potentially high catalytic activity in the synthesis of organometalloidal compounds, such as derivatives of silicon, germanium, or boron. The project plans not only to synthesize traditional homogeneous catalysts but also to develop so-called hybrid catalysts, which combine selected advantages of both homogeneous and heterogeneous catalysts, such as the possibility of reuse. The final two research tasks focus on gaining knowledge about innovative techniques, such as electrocatalysis and photocatalysis, which could, in the future, serve as alternatives to traditional catalytic methods.