During the last decade, we witnessed a major advancement in microelectronics, portable devices and (hybrid) electric vehicles industries. Inseparable from that phenomenon, an advancement in energy storing device field took place. Lithium-ion batteries dominated aforementioned areas, due to their ability to store large amount of energy per mass unit. However, their constantly growing popularity raises concern about limited global resources of lithium, their possible depletion in upcoming years and increasing cost of Li.

Hence, the urge of finding new designs for energy storing devices, basing their working principles on different element. Researchers started to focus on sodium, as possible candidate to replace lithium in batteries. Due to its availability, almost unlimited global resources, and low cost, sodium is first in line to be used in new generation of energy storing devices. However, replacing lithium with sodium in batteries reduces the amount of energy that could be stored in the system. To minimise this effect, one need to use battery components which, when put together, will create a device with high operating voltage.

Excellent candidates for battery components, from negative electrode perspective, would be carbonaceous compounds, especially graphite. However, before application, it needs to be subject to a variety of processes which will enhance its energy storing capabilities in sodium batteries. From the positive electrode side, polyanion compounds based on phosphates and transition metals such as iron, manganese, vanadium, cobalt, nickel and so on, were already successfully implemented in sodium batteries as energy storing materials.

The main goal of the proposal is application of an easy and cheap method of graphite treatment and its application in sodium battery technology. Carbonaceous materials will be later paired with sodium-vanadium phosphate into fully operational sodium-ion battery. Development of graphite treatment method and synthetic procedures for sodium-vanadium phosphate for sodium systems, will make a significant contribution to sodium-ion batteries field, along with speeding up their advancement among energy storing devices.