**NATIONAL ASSEMBLY**

**FOR WRITTEN REPLY**

**QUESTION NO 2714**

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**"2714 Mr N Paulsen to ask the Minister of Science and Technology:**

**Whether her department is funding any research into renewable energy, block chain, and water saving; if so, what (a) is the total amount of the funding in each case and (b) are the relevant details of each research?
(NW3009E)**

**REPLY:**(1) Block Chain is supported by the DST through research projects and human capital development. The total funding provided is R550 000.00 with the Council for Scientific and Industrial Research (CSIR) spending R4 081 800.00 of their Parliamentary Grant on the application and understanding of blockchain and the wider distributed ledger technologies.

(2) Details of the research:

Between 2011 and 2017, the DST funded a human capacity development programme in Information Security. The programme funded mostly MSc and PhD candidates. Amongst the students funded were two MSc candidates who completed their studies in 2016, and their areas of research were related to the Blockchain, i.e.

(2.1) A study of the Blockchain involving its application to the South African Social Security Agency (SASSA) was conducted. The study assessed how the Blockchain functions and also assessed the application of the Blockchain to other systems other than cryptocurrencies, e.g. electronic voting, smart contracts, and intellectual property rights.

(2.2) On 19-20 July 2018, the DST through the Office of Digital Advantage (ODA), hosted a workshop that looked at Blockchain beyond its application in crypto-currencies. The workshop pulled together SMEs, and other role players. The long-term aim is to stimulate innovations for socio-economic benefits of distributed ledger technologies (DL Ts) and Blockchain technology in areas such as public health, agriculture, food safety/security, energy availability, environmental management etc. The DST, ODA and the CSIR are working on a concept to further unpack this work whose funding will extend beyond the CSIR.

(3) Renewable Energy initiatives supported by the DST amounts to R167 million (2018/19) that is split amongst the following interventions:

(3.1) Solar energy and Wind energy technologies - R27 million per annum;

(3.2) Bio-energy - R14 million per annum (algae based, lignocellulose based and decision support tools - R7 million and Research Chairs - R7 million);

(3. 3) Energy storage (to support performance of alternative/renewable energy) - R 15 million per annum; and

(3.4) Hydrogen and fuel cell technologies - R96 million per annum.

(4) The above mentioned investments are made in support of broader government initiatives in support of the National Development Plan, energy security and access (Integrated Resource Plan) with the intent of diversifying South Africa's energy portfolio (Integrated Energy Plan). The different focal areas have specific strategic plans articulating the desired outcomes.

(5) Water savings initiatives supported by the DST amounts to R2 540 000.00.

This includes demonstration projects and post-graduate research.

(6) Details of the demonstrations and post-graduate research:
(6.1) The DST through the Water Research Commission conducted a study into Water Efficiency for R200 000.00. The main finding in relation to **non-revenue water and broader efficiency is that it is a highly mature** and well invested RDI area in SA The major challenges lie in the implementation of recommendations by government (particularly at **municipalities). In our view, water reuse needs to be considered in relation to water savings as well.**(6.2) In addition the DST funded 3 post-graduate students to a total of R640 000.00 with a focus on water savings through the following projects: Economic Analysis of water recovery from flue gas: A South African Case Study, UWC; Water recovery from flue gas through membrane technology, UWC; Assessment of constructed wetlands for wastewater treatment and reuse, UKZN with one student focussed on agricultural water efficiency and savings.

(6.3) Three demonstration projects were conducted with the City of Johannesburg, who offered up test sites after a call to all municipalities to a total of R1.7 million. The City of Johannesburg not only provided test sites but also their staff to be trained on the technologies. The three technology demonstrations were for:

(6.3.1) Look.See Do, which is an augmented reality tool to assist technicians in municipalities to fix machinery. This can get **around waiting for specialised technicians to fly out from** Europe and elsewhere to assist with maintenance. The technician can assist the municipal technician through this tool without being physically present.

(6.3.2) Aquatrip is a technology that can assist with water leaks through detecting a drop in pressure, signifying a leak, and closing the valve in the pipe. This then alerts the consumer that there is a problem and the leak can be fixed and the valve reset, much like the trip switch on an electrical distribution board.

(6.3.3) Arumloo is a low flush toilet developed on Biomimicry principles.
The shape of the arum lily was the inspiration for the design of the toilet It allows for a complete flush to occur on 1.5 - 2.0 litres of water, which is significantly better than the current 6 litre flush of the smallest cistern.