11.15 - 12.30

# Research & Technology Organisations

*Frans van Gemerden (chair) – Netherlands Organisation for Applied Scientific Research*

*Thulani Dlamini – CSIR*

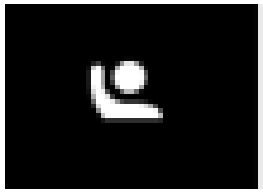
*Marcin Kraska - Łukasiewicz Research Network,*

# Research & Technology Organisations

Sukiennice room

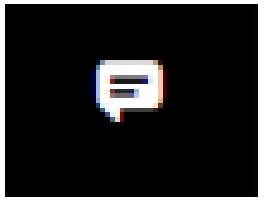
# Impact of Science

**4-6 November, Krakow**



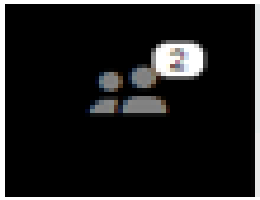
**Broadcast permission**:

- Turn on your microphone and/or camera
- Participate in the discussion



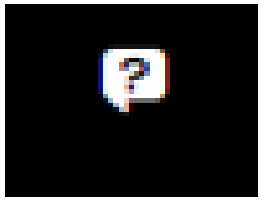
**Conversations**:

- General remarks
- Discussion
- News (links)



**Who are the attendees?**

- Speakers
- Participants



**Q&A**:

- (Targeted) questions
- Speakers answer the questions live

**Lay out view**:
Full screen, Tiled, Thumbnail

AESIS

#IoS20

# IMPACT OF SCIENCE
# RESEARCH & TECHNOLOGY ORGANISATIONS

## INTRODUCTION:

FRANS VAN GEMERDEN
TNO, THE NETHERLANDS

## SPEAKERS:

DR. THULANI DLAMINI
CSIR, SOUTH AFRICA

DR. MARCIN KRASKA
ŁUKASIEWICZ RESEARCH NETWORK,
POLAND

# TNO MISSION

# ‘INNOVATION FOR LIFE’

TNO CONNECTS PEOPLE AND KNOWLEDGE TO CREATE INNOVATIONS THAT BOOST THE COMPETITIVE STRENGTH OF INDUSTRY AND THE WELL-BEING OF SOCIETY IN A SUSTAINABLE WAY.

THIS IS OUR MISSION AND IT IS WHAT DRIVES US, THE OVER 3,400 PROFESSIONALS AT TNO, IN OUR WORK EVERY DAY!

TNO innovation for life

# WE DO THIS BY TAKING A MULTIDISCIPLINARY APPROACH

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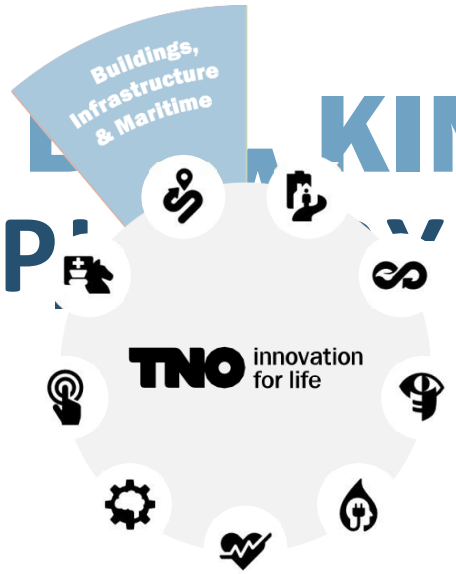
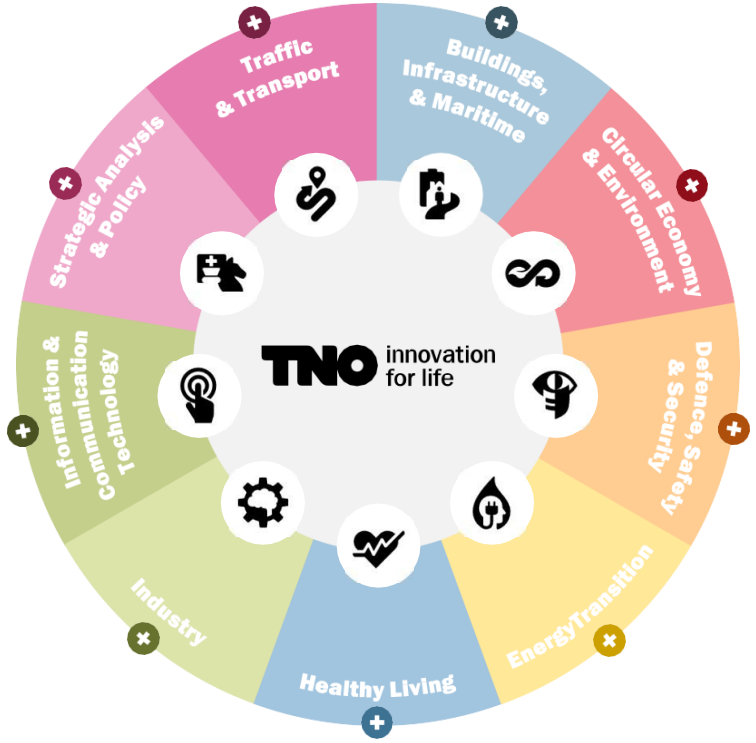
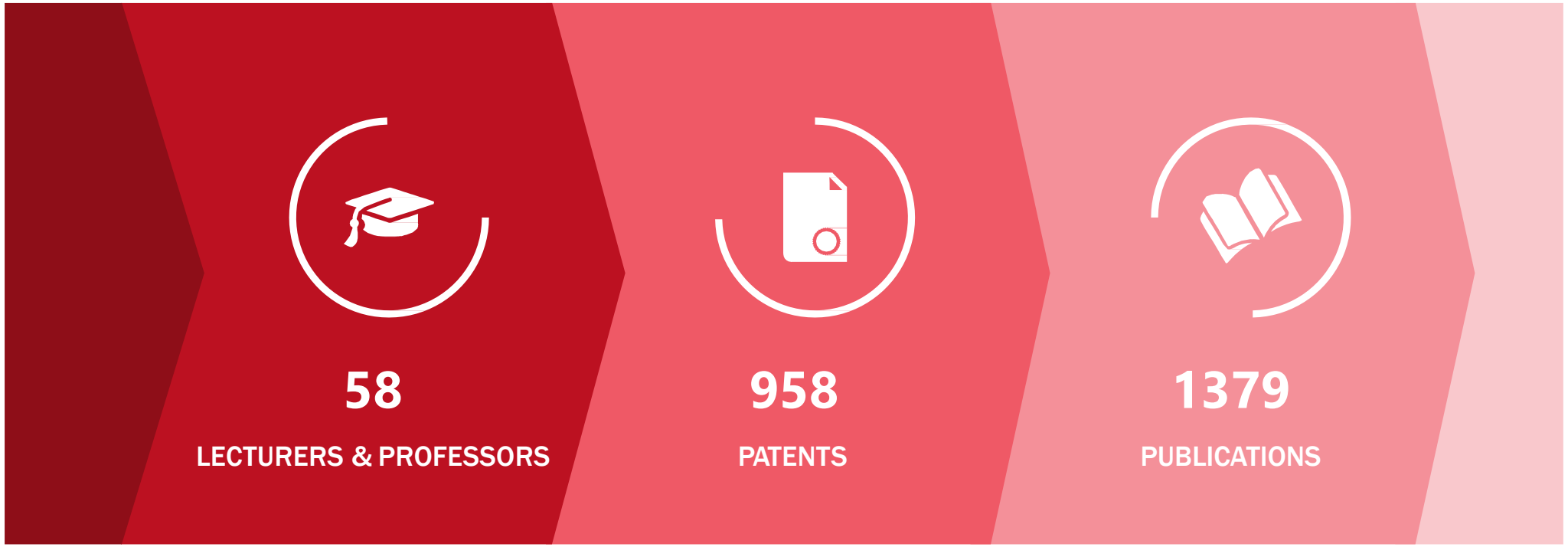


# WE DO THIS BY TAKING A MULTIDISCIPLINARY APPROACH



# SCIENTIFIC PROFILE

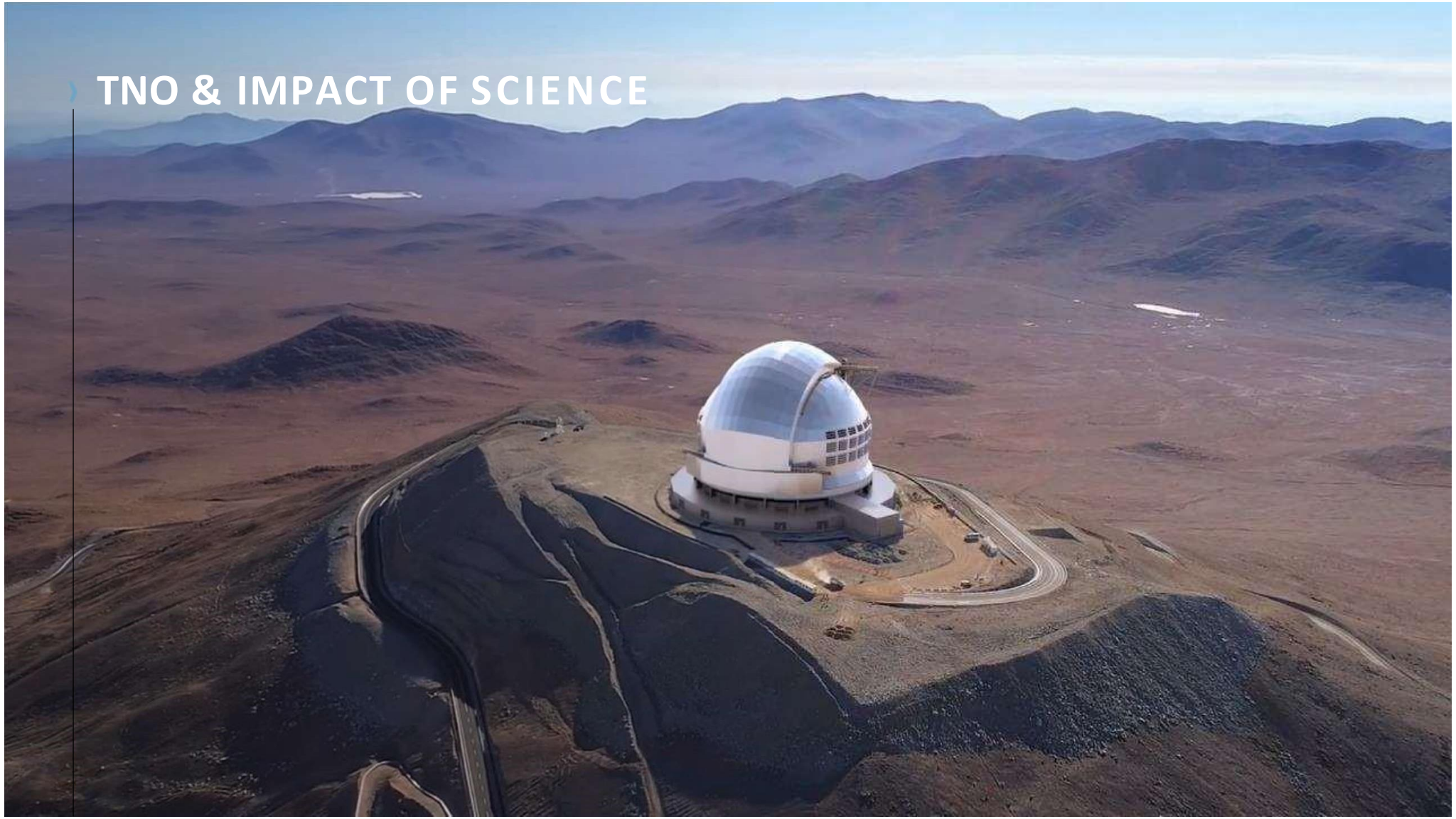



TNO innovation for life

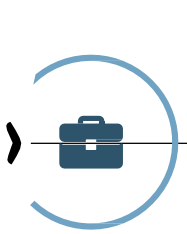
# INTERNATIONAL PROFILE


TNO innovation for life

# TNO & IMPACT OF SCIENCE



# ADDED VALUE 9 RTOS
# (RESEARCH 2016)

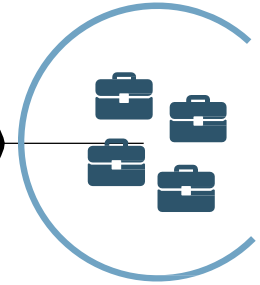


**1 JOB**

IN RTO

**4 EXTRA JOBS**

IN EUROPE
(2016)



**€ 1 INVESTED**

IN RTO
(by government as operational grants)

**€ 3 IN RETURN**

TO GOVERNMENTS
(2016)

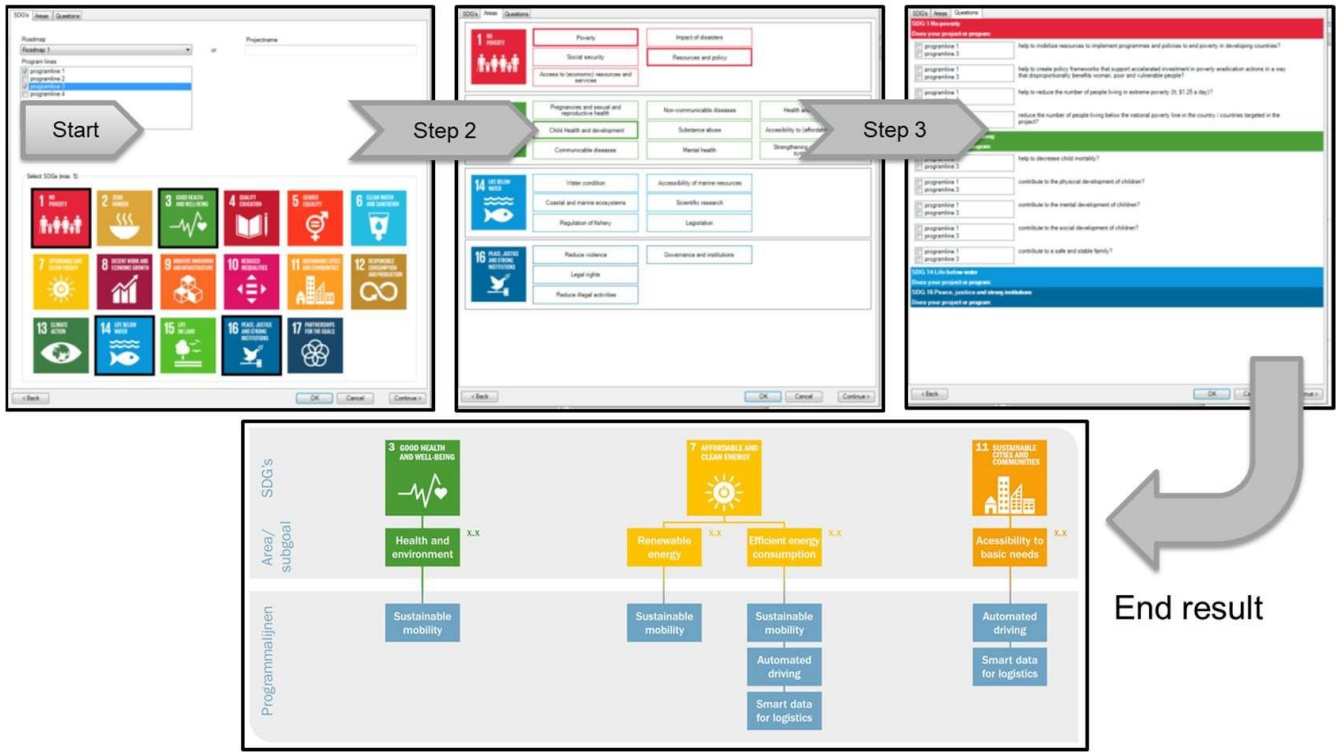
TNO innovation for life

# INSIGHT INTO IMPACT

- 5 categories that define TNO's contribution to society
  - Using indicators & data
  - Focus on output and outcome
  - Embedded in the regular planning & control cyclus
  - Appealing examples that illustrate all data
  - Incorporated in the annual report + current web page

- Focus on 7 sustainable development goals
  - Based on the TNO portfolio
  - Relevance for our 9 units and TNO as a whole
  - Appealing examples that illustrate our contribution to SDG's
  - Incorporated in the annual report + current web page

# MAPPING SDG'S



# MAPPING SDG'S

- Buildings, Infastructure & Maritime
- Circular Economy & Environment
- Defence, Safety & Security
- Energy Transition
- Healthy living
- Industry
- ICT
- Traffic & Transport

# FOCUS ON 7 SDG'S

- The most relevant SDG's for TNO (based on roadmaps)


- SDG's that apply to the whole of TNO

# NEXT SPEAKERS:

**DR. THULANI DLAMINI**
**CSIR, SOUTH AFRICA**

**DR. MARCIN KRASKA**
**ŁUKASIEWICZ RESEARCH NETWORK, POLAND**


THANK YOU FOR
YOUR TIME
TNO innovation for life

**Dr. Thulani Dlamini**

**Chief Executive Officer, CSIR**

# *The CCSIR experience in connecting people and knowledge by science-industry collaboration for the wellbeing of society*

**6 November 2020**

CSIR

Touching lives through innovation

# Presentation outline

- Mandate
- Vision, mission and values
- CSIR sector clusters
- CSIR offering for science – industry collaboreation
- Case studies

# The CSIR mandate

## CSIR MANDATE

"The objects of the CSIR are, through **directed** and **particularly multi-disciplinary research** and **technological innovation**, to foster, in the **national interest** and in fields which in its opinion should receive preference, **industrial** and **scientific development**, either by itself or in **co-operation with principals** from the **private** or **public sectors**, and thereby to contribute to the **improvement of the quality of life** of the people of the Republic, and to perform any other functions that may be assigned to the CSIR by or under this Act."

***(Scientific Research Council Act 46 of 1988, amended by Act 27 of 2014)***

# Vision and mission

## VISION

*We are accelerators of socio-economic prosperity in South Africa through leading innovation*

## MISSION

*Collaboratively innovating and localising technologies while providing knowledge solutions for the inclusive and sustainable advancement of industry and society*

# Technology – Sector Clusters

## Positioned to drive SA's industrialisation

**Industry advancement clusters**

**Advanced Agri & Food**

Innovate to strengthen primary production, agro-processing and advance rural economies

**Future Production**
**Chemicals**

Establish state-of-the-art (bio)-chemistry to drive local pharmaceutical and the broader chemical industries

**NextGen Health**

Develop technologies to drive improved health outcomes and patient-centric healthcare delivery

**Future Production**
**Manufacturing**

Strengthen manufacturing value chain to enhance Industry Competitiveness

**Future Production**
**Mining**

Support the growth and revitalisation of the mining industry

**Defence & Security**

Build resilient defence and security capabilities to strengthen national security technology capacity

**Industry and society enabling clusters**

**SMART Places**

Effect smarter resource use, sustainable economic growth and smart infrastructure and service developments

**SMART Mobility**

Enable South Africa to have an efficient, effective and integrated logistics sector

**NextGen Enterprises & Institutions**

Support the digitalisation of government, public institutions and private sectors

**The clusters are technology industry convergences that represent the CSIR's strategic focus.**
**They have been selected based on national priorities, potential for socioeconomic impact and the fourth industrial revolution.**

# The CSIR in numbers

The CSIR is a science council, classified as a national government business enterprise.

## IN NUMBERS*:

Pretoria
Johannesburg
Durban
Cape Town
Stellenbosch

**2 104**
Total staff base

**1 367**
SET base

**63%**
Black South Africans

**35%**
Female South Africans

**299**
Staff with PhDs

**413**
Staff with M-qualifications

**437**
Publication equivalents

**21** New patents

**37** New technology demonstrators

**R2 742 m**
Total income

**32.3%**
Grant Funding

**R3.6 m**
Royalty and licence income

**R122.6 m**
Total investment in HCD

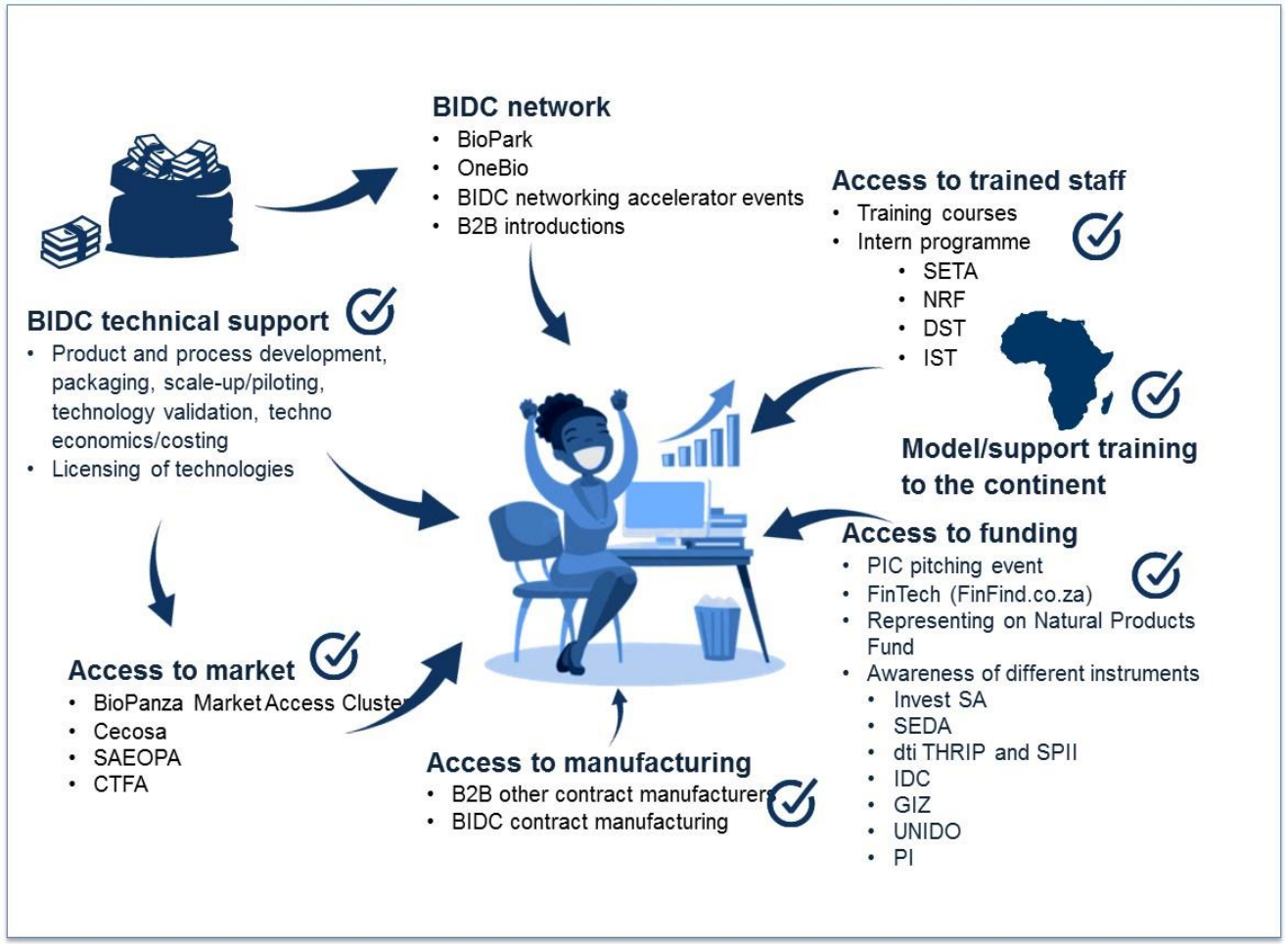
* Figures are as at 31 March 2020, covering the 2019-20 Financial year, and are subject to final audit confirmation.

# CSIR offerings – industry collaboration

# Stimulating the Industrial Development with science

- Connect ideas to markets
- Support entrepreneurs and SMEs monetise IP
- Create platform for industry collaboration
- Provide unique world class infrastructure as well as science, engineering expertise
- Solve technical problems that enable technology commercialisation

# Stimulating the biotech sector



# Impact of CSIR Biotech Industry Development Centre

- 37 Enterprises contracted since inception
- 105 products in the market
- > 200 jobs created
- 90 interns trained
- 24 licence agreements signed with CSIR




Touching lives through innovation

# OptimusBio

## Market opportunity

- B2B supply of ingredients, finished goods and consumer products.
- ~135 product line items from base technology, enables supply to diverse market applications
- Increase in demand for green products globally


## Unique value position and product description

- Biodegradable and biologically active Global Green Tag certified products for cleaning, personal care, water and waste management
- Full local manufacture of indigenous microbes and productisation

## CSIR involvement, support and impact

- CSIR licenced technology
- Product development support through BIDC programme
- Contract manufacture of biologicals (microorganisms)
- Research collaboration
- Joint project funding
- Preferential rental arrangement with CSIR, located on campus
- ~R6m/a, ~5 tons per month

OPTIMUSBIO
GREENER TOGETHER

CSIR
Touching lives through innovation

# Phephisa

## Market opportunity

Plant based skincare remedies from traditional knowledge

## Unique value position and product description

Standardised plant extract formulated into a variety of dermatologically tested cosmetic products with a good shelf life based on indigenous knowledge

## CSIR involvement, support and impact

- Standardised extraction process
- Clinical testing for dermal safety
- Designed equipment specification based on demand projections
- Hands-on training to enterprise staff in safe operating procedures
- With this support Phephisa has leveraged support to construct a pilot scale facility

# Photonics prototyping facility

## Market opportunity

- Additive Manufacturing (AM) or 3D printing key to 4IR
- Apart from Aeroswift, no local capability to construct metal AM systems
- AM market is growing, globally a US$ 10 billion market in 2019 with a CAGR of >20% per year over the past 10 years

## Unique value position and product description

- Aditiv Solutions new local startup (2019), 4 employees
- Design own metal 3D printer – low cost compared to global commercial competitors
- Small footprint system, aimed at the local service provider industry

## CSIR involvement, support and impact

- Provided capabilities and infrastructure to test and evaluate high power lasers and beam delivery system required in the product
  - Clean room facilities to support the optical integration and testing of the core components for the metal 3D printer
  - CSIR will assist Aditiv Solutions with the procurement of a laser, integration, testing and optimisation of the high power laser
- Provide prototype support to used to develop the local market




CSIR
Touching lives through innovation

# Lighthouse Healthcare

- Licenced the CSIR patented micro encapsulation process
- Probiotics manufactured at CSIR
- Enterprise formulated probiotic containing  meal replacement beverages
- Currently stocked by independent pharmacies, online platforms (Faithful to Nature, Takealot)


https://velobiotics.com/

# BIDC unique facilities

# Some products developed for SMEs


VIDA SUPERFOODS


SUCCESS FOODS


PLS
PROFESSIONAL LABORATORY SERVICES

le Mvelo
IT'S IN OUR NATURE

SETŠONG
AFRICAN TEA CRAFTERS

Others:

- Animal feed (alternative protein sources)
- Biotech: reagents, diagnostics etc

CSIR
our future through science

END

Łukasiewicz
Sieć Badawcza

# Impact of Science Conference

# “Research & Technology Organisations”

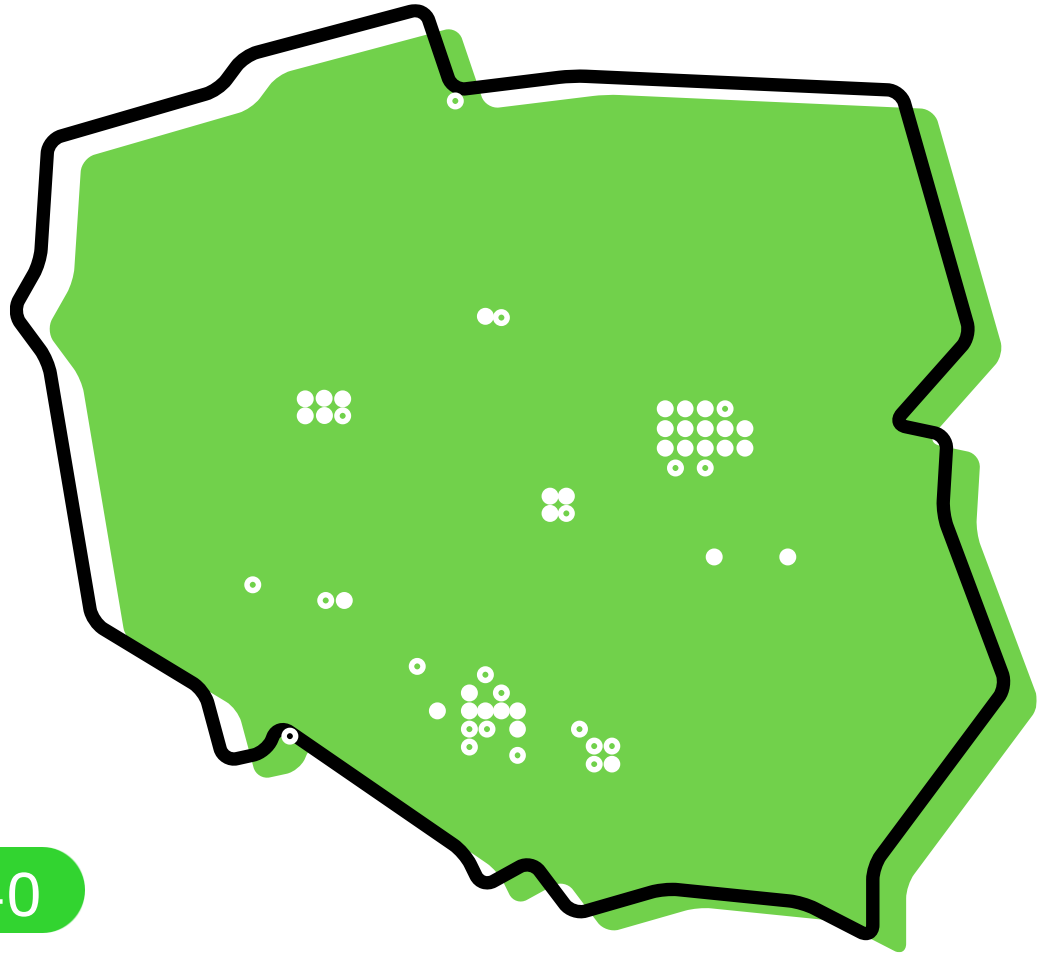
Marcin Kraska, Vice -president of the Łukasiewicz Research Network

- November 6th, 2020 r.

# Łukasiewicz's vision


Creative people who are passionate about developing innovations that help drive forward the national economy. We are working according to proprietary system as part of which everyone can challenge us and receive R&D project proposition for free.

# We are located all around Poland



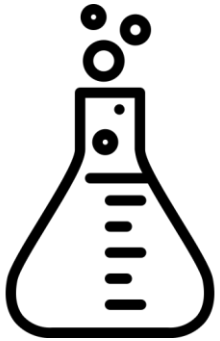
## Łukasiewicz institutes by city

**(No of branches)**

**Warsaw 13 (1)**
**Poznań 5 (1)**
**Gliwice 3 (3)**
**Łódź 3 (1)**
**Cracow 1 (3)**
**Katowice 2(0)**
**Wrocław 1(1)**
**Toruń 1(1)**
**Kędzierzyn-Koźle 1(0)**
**Puławy 1(0)**
**Radom 1(0)**
**Zabrze 1(0)**
**Gdańsk 0(1)**
**Opole 0(1)**
**Międzylesie 0(1)**
**Piastów 0(1)**
**Legnica 0(1)**
**Skawina 0(1)**
**Sosnowiec 0(1)**
**Pszczyna 0(1)**
**Krupski Młyń 0(1)**
**Piaseczno 0(1)**

# What makes us exeptional?

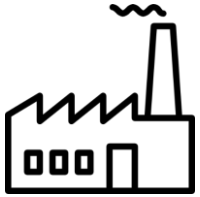
**We are Europe’s third largest research network**
Leading R & D market player in Central & Eastern Europe



**We are a modern R & D network**
We operate **440** labs across the country

**We operates top class research infrastructure**
3,762 key R & D equipment out of which **497 are unique** in Poland

# How do we work?



**We anayse your needs**

**The application form can be found in the *For business* tab on [www.lukasiewicz.gov.pl/en/for-business//](www.lukasiewicz.gov.pl/en/for-business//)**

**5 days**

**We crowdsource solutions to your challenge**

Our experts from 33 R&D Institutes create dedicated proposals to solve your business need.

**10 days**

**We create a portfolio of recommended solutions**

We map all the necessary R & D resources across the Łukasiewicz network

**In-house Project Workshop**

Best solutions shortlisted by the Łukasiewicz experts

**Date set with the business Client**

**(2-3 weeks)**

**Business meeting**

**We present our best solutions to the Client**

**Success!**

**We sign the contract**

We agree terms & conditions of the contract and kick-off the project

# Łukasiewicz for business

*total numer of **Łukasiewicz2Business** and **Business2Łukasiewicz** as on 7 August 2020

**76%**

**Business Clients describes our solutions as interesting**

**490**

***No of R&D solutions offered by Łukasiewicz for Business Clients since 15 November 2019**

# Łukasiewicz – research priorities

## Łukasiewicz Research Groups

Sustainable economy and energy

bioeconomy | new materials, materials recovery | transmission and storage energy | building materials with low energy consumption and material consumption and high insulation | sustainable cultivation processes | green chemistry

Digital transformation

automation, robotics | artificial intelligence | intelligent services for citizens and businesses | data science digital networking, Internet of Things (IoT-ntelligence of Things), AR – augmented reality | smart industry and logistics | smart cities | digital agriculture

Smart mobility

Intelligent and green logistics infrastructure | autonomous mobility and network solutions | structural materials and processes for design and fabrication in transportation | cargo unmanned aerial vehicles (UAVs) | clean aviation | electromobility

Healthy living

innovations in the healthcare system | medical products | innovations in medical technologies

# Łukasiewicz - strenghts

Cooperation **with large industrial partners and SMEs** (i.e. collaborative projects, contract research and services, trainings)

**Broad thematic scope** of research and innovation activities

Cooperation with local universities (especially **technical universities**) and other research organisations

Access to qualified **research personnel and technology infrastructure**

Cooperation with **European, national and regional authorities and stakeholders** (i.e. EARTO, Climate-KIC, EIT Health, EIT Urban Mobility, EIT Manufacturing)

# Łukasiewicz – strategic issues 2021-2027

**International cooperation**
- engagement in European Green Deal calls, European Partnerships including communities of EIT

**Bilateral cooperation**
i.e. programme supporting R&D implemented by the NCRD

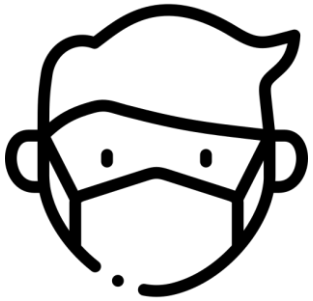
**Mobility programmes**
i.e. internships, study visits

**Commercialisation of the results of R&D projects**
i.e. cooperation in start-ups incubation and acceleration

# The Łukasiewicz Research Network

## Science Shield for Covid-19

**VENTIL**
**device**



**Production of**
**masks and protective visors**

**Highly sensitive**
**screening tests for Covid-19**

**18** **Łukasiewicz's Institutes**
**Research Group HEALTH**

**1724** **devices of key**
**medical eqipment**
**Research Group HEALTH**

Łukasiewicz
Sieć Badawcza

**Thank you for your attention!**

**More information about Łukasiewicz:**

**www.lukasiewicz.gov.pl/en**

# Up Next

| | |
|---|---|
| 12.30-13.00 | Break |
| 13.00-15.00 | Closing Panel: "Recommendations for the Polish science system, and beyond" |