



Defence Research

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October 2013

TNO location Den Haag





Defence, Safety and Security

Managing Director



Defence, Safety and Security
Henk Geveke

Director of Innovation

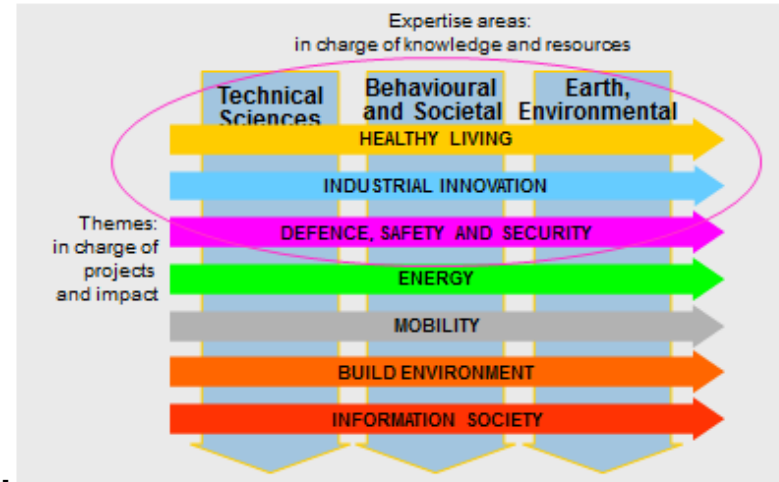
Defence Research
Henk Jan Vink



Safety and Security Research
Ida Haisma



Our organization





Defence, Safety and Security

Innovation for a more secure sense of life

- › It is crucial for prosperity and welfare that society is safe and has a sense of security. Security is becoming increasingly more complex, both nationally and internationally, in the physical and digital world, real and perceived. TNO therefore focuses on defence, safety and security, working closely with defence organisations, the police, emergency services and industry.
- › We support these organisations through both technological and behavioural innovations, to enable them to act more effectively.



Separate status of TNO defence research

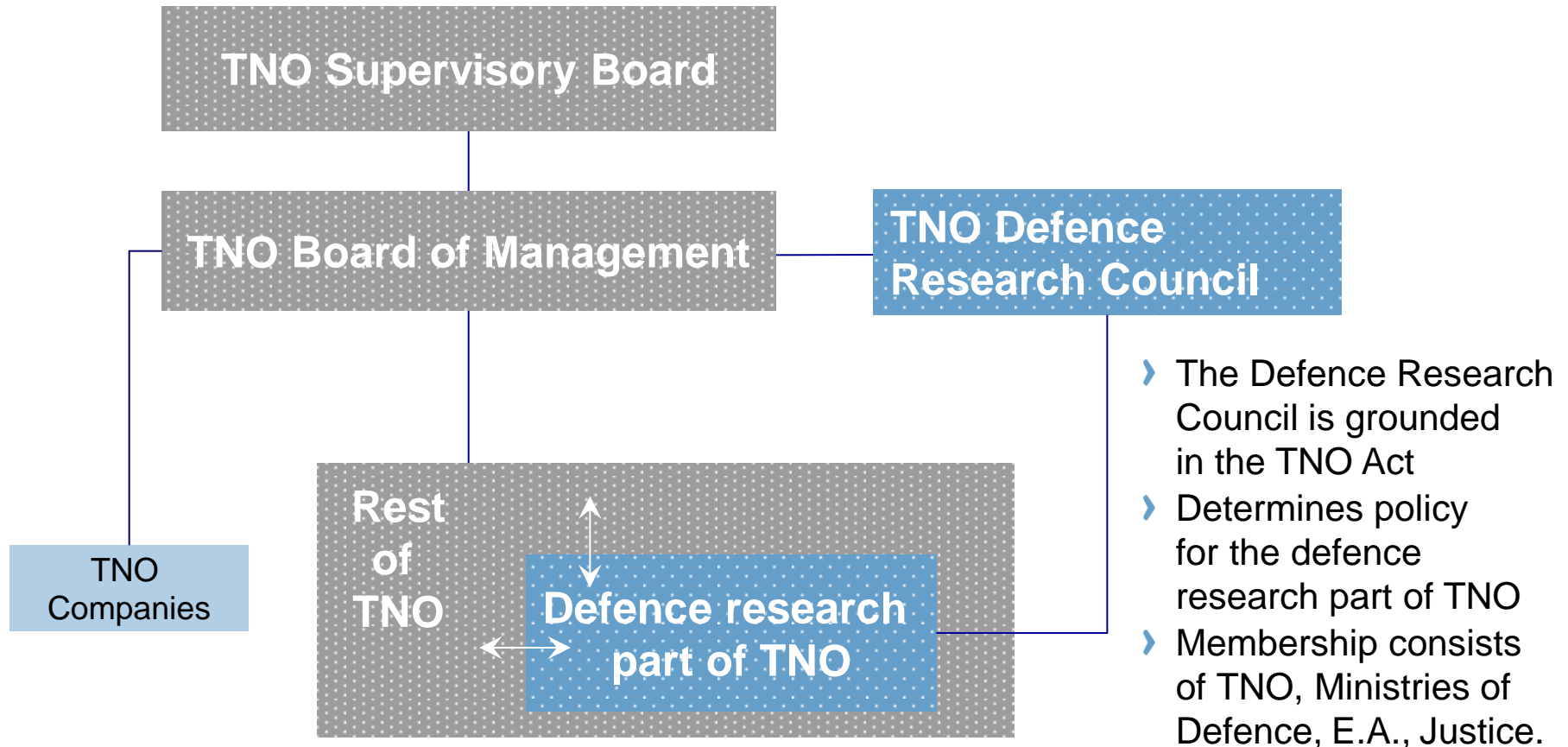
The Dutch approach

- › The National Defence Organisation TNO was founded in 1946, and from 1947 onwards it has incorporated the various MOD laboratories.
- › Since then the major part of defence research in The Netherlands is carried out at TNO, as a unique form of public-private partnership.
- › Defence research and its governance by the Netherlands Defence Research Council (RDO) are anchored in the TNO Act.





Governance of TNO defence research





Our assignment

Create and maintain a knowledge base (of excellence) on defence specific technologies as appointed by the MoD.

All our efforts are focussed on the application of this knowledge base for MoD, international institutes and industry.

To maintain broadness, depth and affordability we continuously search for possibilities to apply the knowledge base (in- and outside the defence domain)



Defence Research 80 M€

Facts & figures

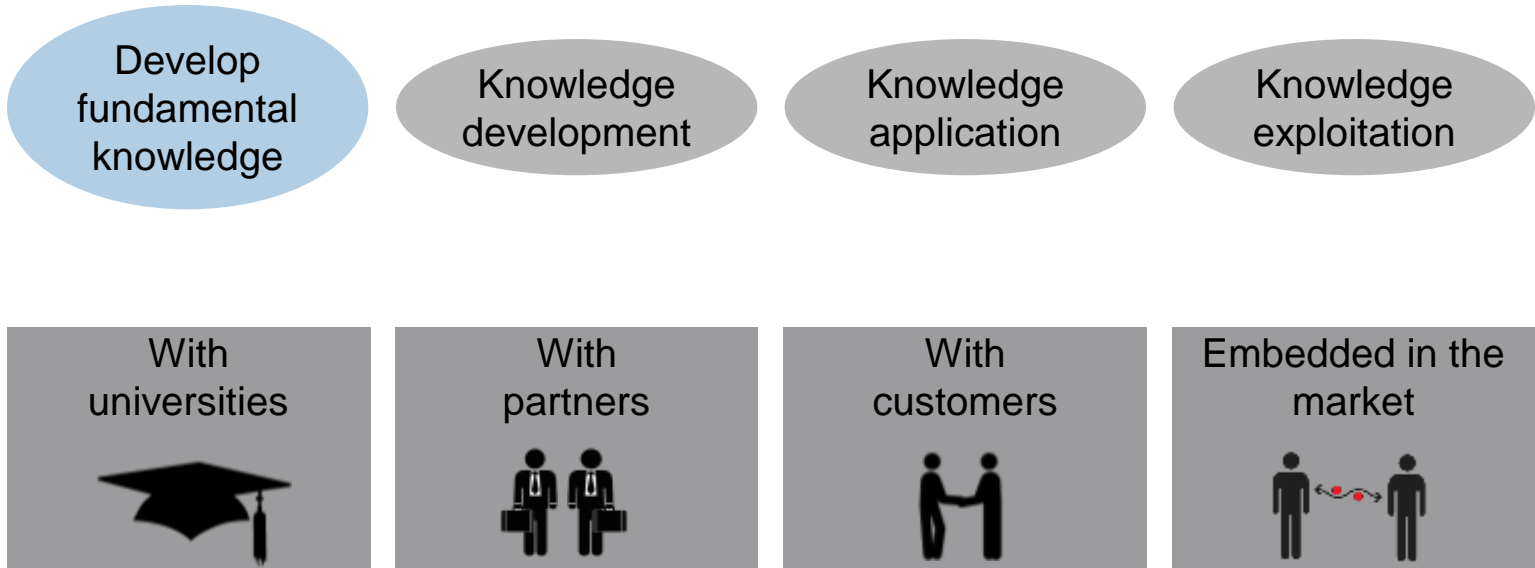
- › **Ministry of Defence 56 M€**
 - › Research programs (knowledge base)
 - › 63 programs, duration 2-5 years
 - › Total volume: 33 Million € -> **11 M** € spent on gov2gov international cooperation
 - › Contract Research 23 M€
 - › Technology development
 - › (Co-) product development
 - › Testing
 - › Advising and consultancy
- › **International institutions 9 M€**
 - › NATO, EDA, EU, Foreign MoDs
- › **Defence industry 15 M€**
 - › (inter)national defence industry





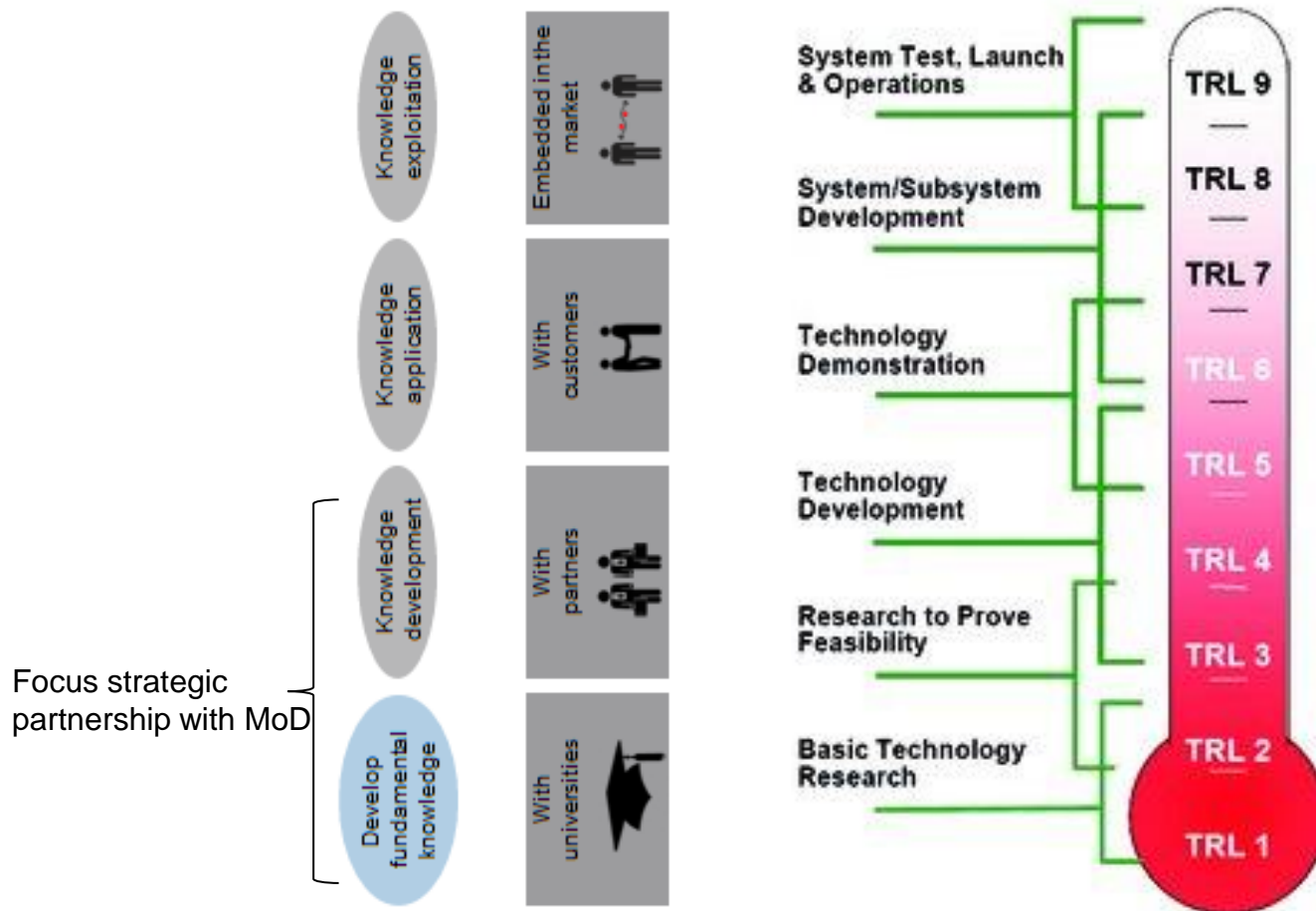
The power of TNO

From idea to innovation





Technology Readiness Levels (TRL)





International

Gov2gov

- › NATO
- › Bi- trilateral MOU's

International funding

- › EU Framework and other programs
- › European Defence Agency

B2B

- › Contractresearch for industry





HIGH-QUALITY FACILITIES



Acoustic Basin



Desdemona



Bioaerosol
Laboratory



Advanced CD&E
Environment ACE



Electronic
Battlespace Facility



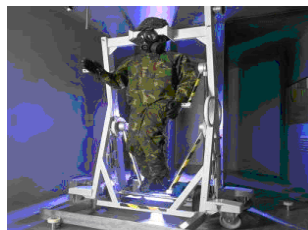
Audio Hall



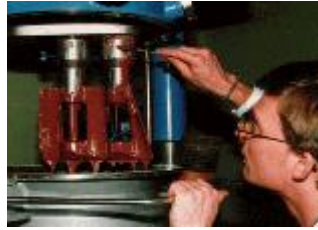
High Tox
Laboratory



Laboratory for
Ballistic Research



Whole System
Test Facility



Laboratory for
Pyrotechnics



Laboratory for
Ballistic Research



Operational
Cockpit



Defence research a domain in transition

- › Besides focus on effectiveness more and more focus on affordability and flexibility
- › From data and information towards understanding (intentions)
- › From unique/monopoly information positions of the military towards 'power of the crowd'
- › From defensive cyber towards offensive cyber
- › Towards new materials for better protection and performance
- › From focus on platforms and materiel towards focus on the soldier, fit for action and fit for life
- › From fighting towards focus on cooperation with men and machines



(Defence) R&D is not a goal in itself

We contribute

- › Flexibility
- › Effectiveness
- › Safety and security
- › Efficiency

How do you measure impact?

Instruments

- Customer satisfaction
- Knowledge position audits (international visitation)



Smart Defence and R&D

MoD and TNO have a long history on gov2gov cooperation

- › NATO (focus more on exchange of information)
- › MOU bi- or trilateral (focus more on in depth research)

Out of the 33 Meuro (TNO knowledge base funding) 11 Meuro is spent on gov2gov.

Mostly on projects, sometimes on long term partnership (CSSM in Kiel)



Why international

- › Political choices:
 - Pooling and sharing, Benelux Forces, more intense cooperation with Germany, EDA
- › Budget cuts
- › Facility sharing
- › Faster results
- › Benchmarking



Thank you

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Innovation for a safer society

