

# Low Cost Networking

Can it provide a solution to wider ICT network access in developing countries?

**TNO | Knowledge for business**



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# Content of presentation

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- CommCase
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# TNO is active in five core areas



**TNO**  
Quality of Life



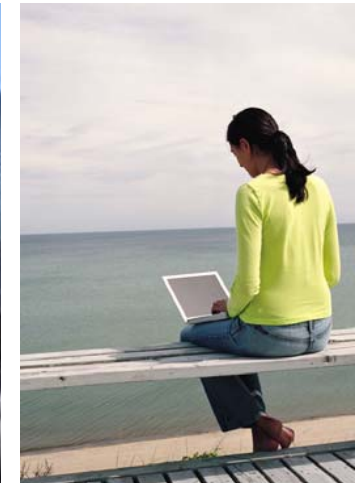
**TNO**  
Defence,  
Security  
and Safety



**TNO**  
Science and  
Industry



**TNO**  
Natural and  
Built  
Environment



**TNO**  
Information and  
Communication  
Technology

## Facts & Figures:

- Annual turnover: 562 Mio euro
- Employees: 4700

# TNO ICT

## Our mission statement: Innovation with ICT

### About us

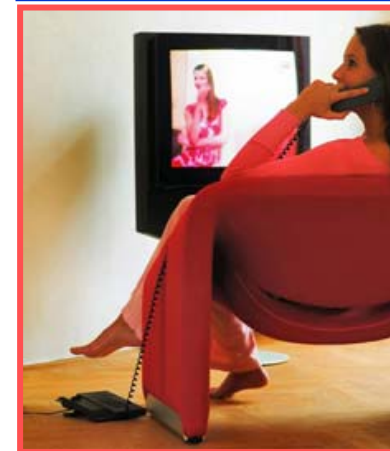
- Established: 1 January 2003
- Bundling of former KPN Research with TNO's ICT related departments
- One of the largest ICT knowledge centers in Europe

### Features and unique selling points

- Independent
- Frontrunner
- Multidisciplinary:
  - Conceptual and hands-on
  - technical, economical and sociological
  - In-depth Telecom and IT expertise

### Key figures

- Annual turnover: EUR 40 Mio
- 375 professionals
- 10 high-quality patents per year
- Locations in Delft, Enschede and Groningen



# Introduction

- Close the digital divide
- Support the millennium development goals
- ICT is economic enabler
- We know it can be done
- We need to scale up
  - technology
  - education
  - organisation
  - legislation
- Low Cost Networking could help

# Low Cost Networking, the concept

- Combine available ICT resources to work together as one virtual network
- Each resource can be owned by different parties as long as certain standards are adopted
- Each addition in the infrastructure strengthens the network

# Example of successful ICT innovation

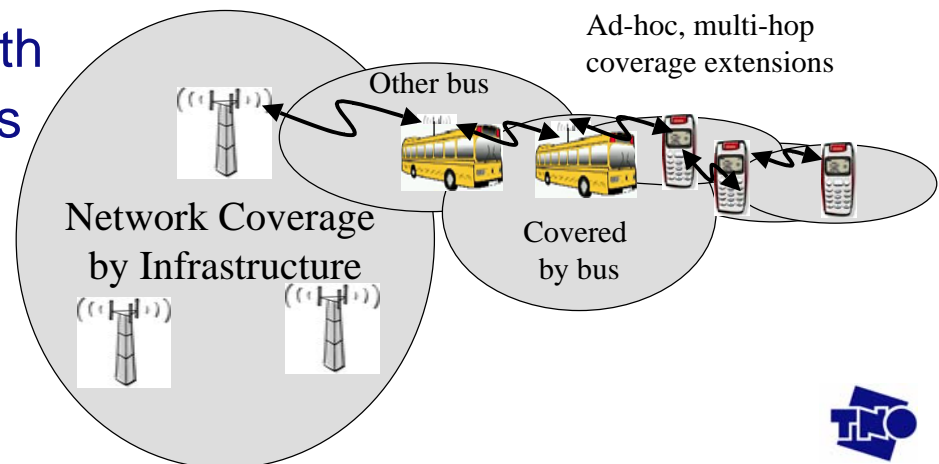
- Grameen phone ladies
- Grameen bank microcredits
- 2,200 telephone ladies employed by Grameen Telecom
- earning an average income of \$300 per year



# Low cost networking

## Technology and business

- Ambient Networks program, EU IST project
- Affordable Wireless Services & Infrastructure, Swedish project
  - Reduce main costs of infrastructure and maintenance
  - Ad hoc and heterogeneous networking
    - Composition:  
to act as one seamless network to the end user
- Apply this technology to situation of developing countries
- Decentralised and gradual growth
  - more but smaller investments
  - microcredit businesses?



# LinkNet

- Goal: to connect rural Zambia to internet
  - robust and at minimal cost
  - operations and maintenance by local people
- LinkNet connected Macha to internet
  - in 18 month from isolated village to a 100 internet connections
  - turn-key container solution
  - Centre of Expertise and Masterplan scaling up to all of rural Zambia



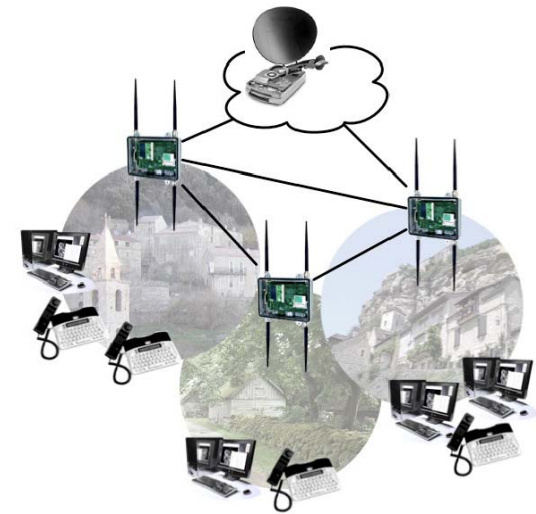
# LinkNet



- Turn-key sea container solution
  - packed with pre-installed technology
  - Very Small Aperture Terminal (VSAT) connection
- Four key elements of success for LinkNet:
  1. Holistic approach involving health institutions, schools and community members;
  2. Training of local people for daily operations and onsite support;
  3. Packaging the technology in the LinkNet Resource Container;
  4. Central training and implementation at the LinkNet Centre of Experience at Macha

# CommCase

- FOKUS (Fraunhofer Institute for Open Communication Systems)
  - Fraunhofer is W3C member and host of German/Austrian W3C office
- CommCase provides:
  - boxes equipped with sensors and antennas
  - that form ad hoc networks
  - communicate between themselves and other nodes
- Characteristics
  - autonomous setup,
  - low power usage
  - operate under extreme conditions
  - operate mains-independent (solar power)
- Idea: extent container of LinkNet with CommCase boxes



# Proposal

- Combine the key success factors of LinkNet with the business model of Grameen phone and the technology of ad hoc or heterogeneous networking, the concepts of CommCase and the LinkNet container
- Collect other best practises
- Support ICT initiatives in scaling up (hands-on experience)
- Make a multi-disciplinary plan to provide complete countries with internet access including:
  - needs assessment
  - technology development
  - necessary legislation
  - development of skills
  - sustainable maintenance organisations
  - business cases



## Acknowledgements:

- Gertjan van Stam; LinkNet
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The innovative partner for industry and government  
in developing and applying ICT knowledge and skills

TNO Information and Communication Technology

[www.tno.nl/ict](http://www.tno.nl/ict)