

# Towards smarter communities

Tapping the power of cloud

# Rural communities need to be included

- As producers of food (and drink), and tourist destinations, rural communities contribute to Scotland's economy and brand, internationally
- However, they are hampered by lack of infrastructure
- Broadband could help offset some of these disadvantages, providing access to a wide range powerful online services



# Rural areas suffer from patchy or even non-existent network coverage

- Fixed broadband services, delivered via DSL (telephone wires), suffer from typically longer line lengths – as well as reliability problems (fair weather broadband)
- Mobile network coverage is also quite varied
  - Voice services not present across remote areas
  - Data services 2.5G/Edge are sometimes available but fail to deliver a useful experience

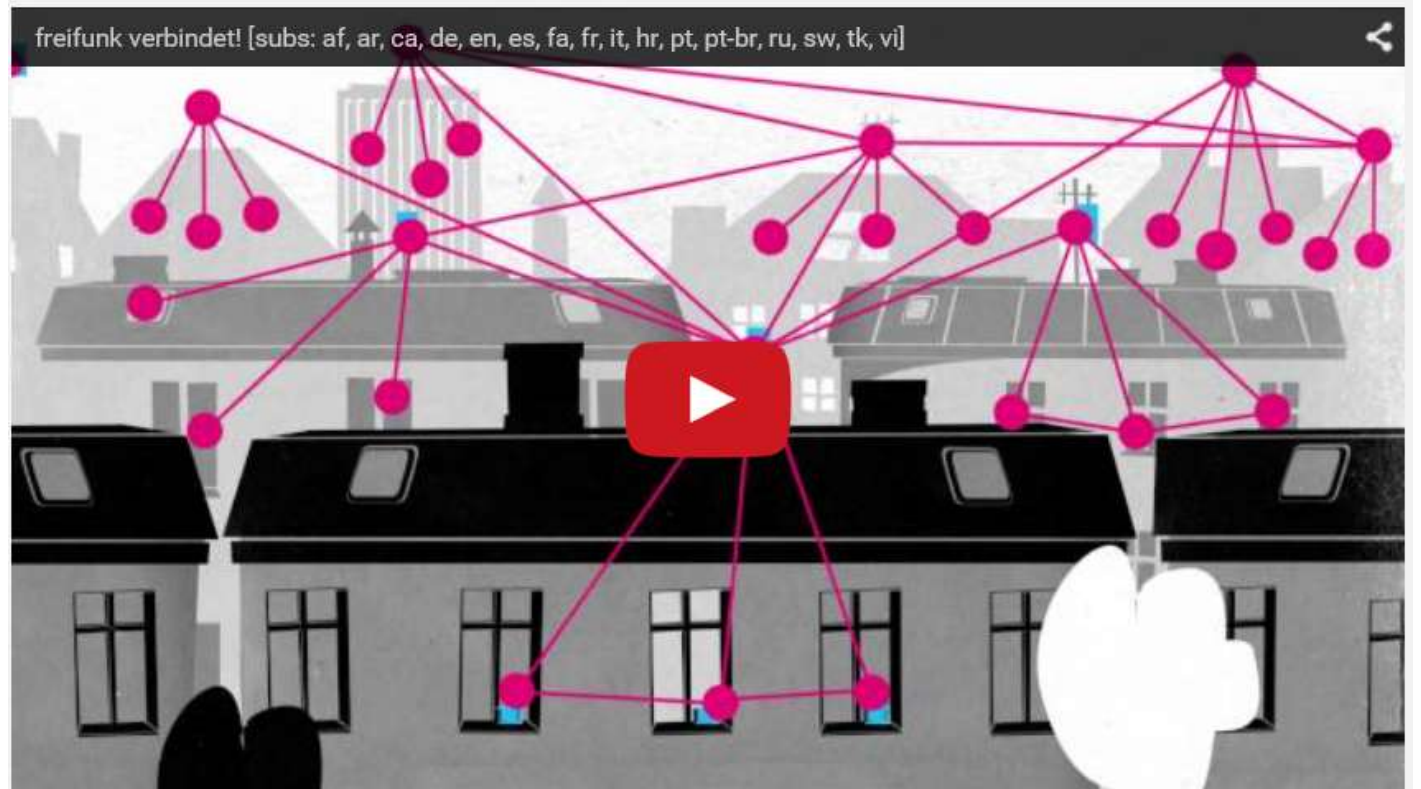
# Licence-exempt wireless technologies can help

A photograph of a construction site in a rural setting. In the foreground, a man in a blue jacket is kneeling and working with a shovel in a trench. To his left, an orange excavator is partially visible. In the background, several people are standing and watching. A stone building is on the right side of the frame. The overall scene suggests infrastructure work in a rural or undeveloped area.

- Together with fibre and microwave backhaul, TV white spaces technology can assist with affordable access
- Licence-exemption enables end-users to procure their own coverage – as with current Wi-Fi technology
- Indeed, with the completion of the IEEE 802.11af standard, TV white spaces becomes Wi-Fi's third band

# White Spaces + Wi-Fi mesh in Berlin

- [Freifunk](#) is a community enterprise to enable free, high quality Wi-Fi access across the outer parts of the city
- The concept is now catching on in other towns in Germany



# Promoting broadband exploitation – tools and skills

- New technology and approaches are emerging to help promote digital inclusion
- Online services, making it easy for people and businesses to get the information they need, generate content & innovate
- The 'Digital Blacksmith' concept, which aims to seed and sustain a core of digital expertise within a community ....



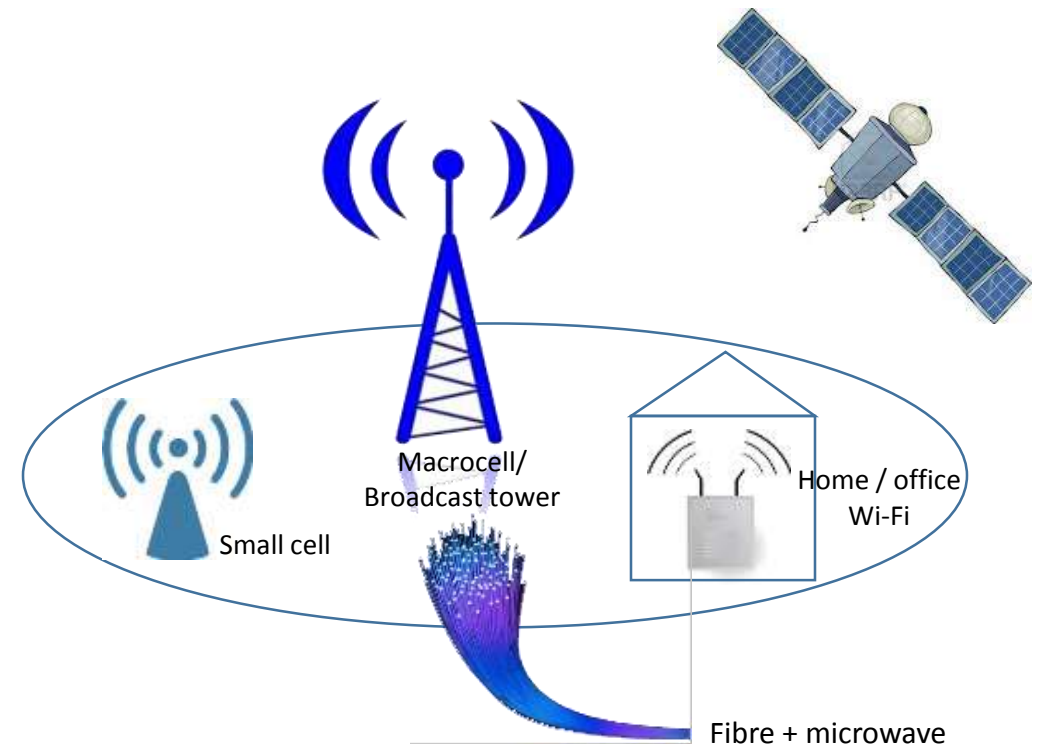
# Using white spaces to assist mobile coverage



**Endaga claims to empower anyone to build their own independent, profitable cellular networks, even in the most remote, sparsely populated places on Earth**

# We need a hybrid approach to connectivity, which is flexible and dynamic

- High performance broadband is needed, supporting the full range of devices and applications
  - Opportunistic access to fibre as well as spectrum
  - Seamless service, i.e. ubiquitous coverage
  - Multiple layers of coverage to suit different application needs – e.g. water quality sensors needs are quite different to those for CCTV
  - Spectrum sharing, to increase efficiency
- Business model(s) that sustain investment – including bottom-up (enabled by Licence Exemption)
- White Spaces, via dynamic spectrum access, have a lot to offer to delivering seamless coverage as well as diverse application needs





# Smarter Communities tapping the power of the cloud

- Power tools for communities are now available through initiatives such as Microsoft's CityNext
- These help with the full range of tasks, from sharing data, through to managing local services
- The scalability of cloud-base services can help small communities benefit too
- To secure these benefits, communities need to invest in connectivity

# Thank you!

**Andrew Stirling**

Chair of the Centre for White Space Communications

[andrew@larkhillconsult.co.uk](mailto:andrew@larkhillconsult.co.uk)

# A few references

- [Dynamic Spectrum Alliance](#) – on how white space technology is being applied, worldwide
- [Centre for White Space Communications](#)
- [Gigabit Libraries](#) applying TV white spaces, using publicly provided backhaul
- [Rural broadband in Lancashire – an example of community infrastructure ownership](#)
- [Overview of Next Gen Optical Access Technologies](#) (EU Cordis output)
- [Guide to FTTH technologies](#)
- [Introduction to TV white spaces – BBC Newsnight clip](#)
- [Ofcom green lights TVWS in the UK](#)
  
- [Microsoft's CityNext](#)