CELTIC-NEXT
Proposers Brokerage Day

18th September 2024, London

Pitch of the Project Proposal

Energy efficient networks: Materials to service

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5G FR2 roll out – how?

Energy Efficient Networks – Materials to Service

While 5G currently presents as the most energy efficient standard, there are still significant challenges in realising net zero within the telecommunications ecosystem. This becomes more pronounced as 5G in the FR2 (>24GHz) frequency range is developed. The proposed idea is to look at the challenges holistically and with a view to develop solutions by bringing the supply chains together. Focus areas could include base station architecture, thermal management, semiconductor chip design and packaging (incorporating cooling and mMIMO), modulation schemes, wave propagation in urban environments and use of metamaterials, AI of base stations while maintaining quality of service provision, cell size and area, green base stations, use cases – when and where to deploy cells versus satellite based communications, public versus private networks, FR1 v FR2 deployment, and even how is energy efficiency defined for telecommunications?

Benefit of the proposal: coordinated effort towards reaching net-zero for telecoms networks

Added value: Opportunity to bring disparate entities and expertise to pull together solutions for a highly complex challenge

There are so many opportunities and angles to approach this from, to address significant environmental and international regulatory challenges

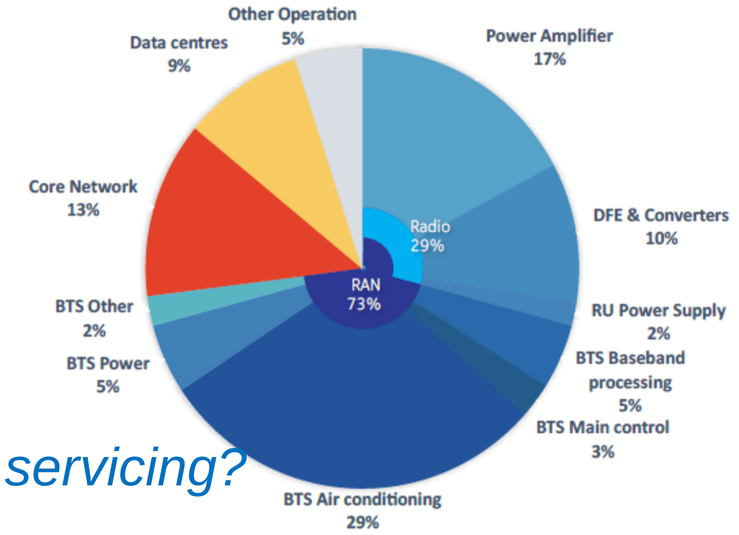
- *Advanced semiconductor materials supplier*

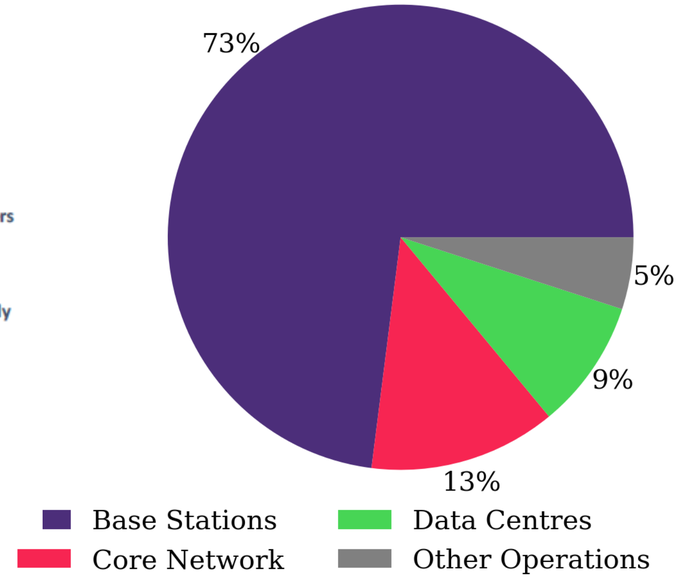
- *Hi tech scale up – Series A funding led by NATO Innovation Fund*
  - *Aim: exploit microgravity environment of space to produce ultra-high quality semiconductor materials*
  - *Terrestrial material production capability*
- *HQ in Cardiff, Wales*
- *Key market is telecoms*
  - *Lead on DSIT Open Networks Ecosystem project: 5G SWaP+C with BT and CSA Catapult*

Energy efficiency: materials to services

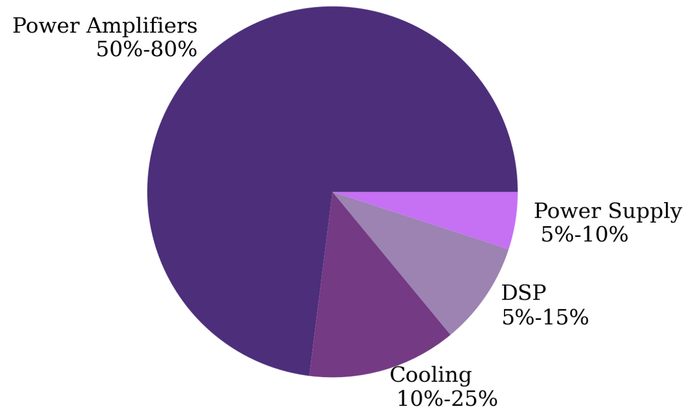
How is "energy efficiency" defined?

- *Energy per bit?*
- *Spectrum efficiency?*
- *Power supply efficiency?*
- *Coverage versus cell size?*
- *Rollout and deployment?*
- *In service maintenance, upgrades and servicing?*
- *Efficient and/or Green?*
- *Site level/equipment level/network level/company operations*





Base materials – lead to better system performance and improved reliability
Power amplifier design
Modulation waveform design for reduced peak power
Base-station design – Green and/or efficient
Service deployment – when/where to use 5G sub 6 GHz v 5G >24 GHz v Wifi v satcom v Legacy/existing
Thermal management optimisation



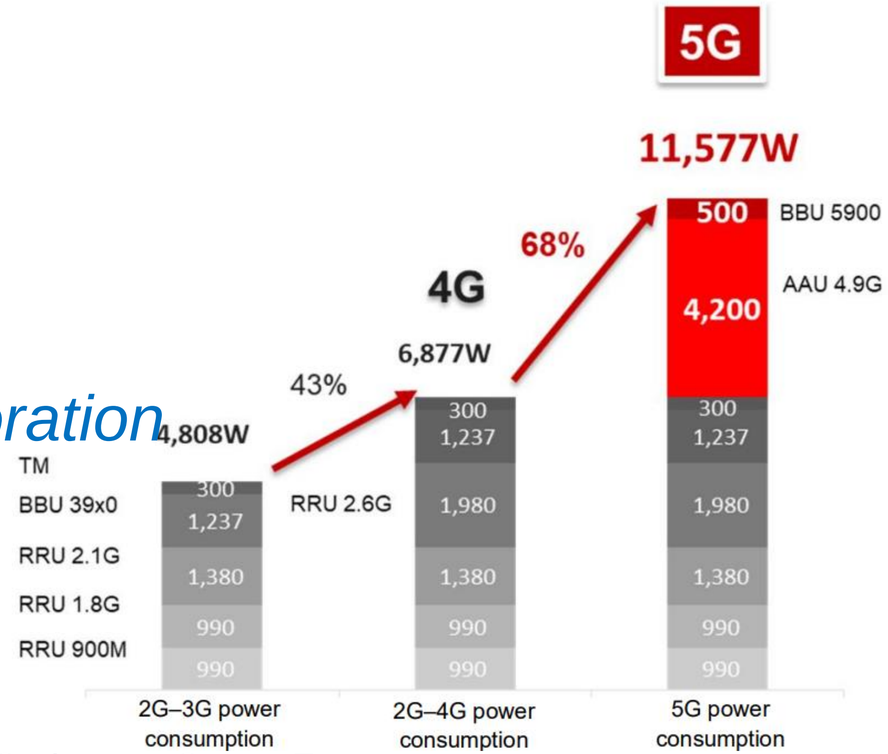
Proposal Introduction (2)

Aims:

Molecular view through to the holistic view of the network:

36 months to realise desired outcomes of:

- *Reduced energy consumption demonstrators*
- *Green energy production concepts*
- *More efficient use of energy as a resource*
- *Resolve some of the 'hard' hardware issues*
- *Cross discipline/sector/industry international collaboration*



Partners

Partners to model and integrate Space Forge advanced semiconductors
Waveform research groups
    Service provider inputs required
Power amplifier designers
System level integrators
Green power supply designers

Limited list – open to further discussions.

Contact Info

For more information and for interest to participate please contact:

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https://www.spaceforge.com/in-space-manufacturing#semi-conductor

Presentation is available via:

Join the Consortium Building Session Monday 23rd at 11 CEST

Join meeting

Join by meeting number
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Meeting password: V2iVkPaNt46