IC1301 -WiPE
Wireless Power Transmission for Sustainable Electronics

WG4 – Ideas to discuss
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Some Ideas to work upon with WG1/2/3/5

» Smart cables: deliver power ***only where necessary*** along a cable (WG1/WG2/WG3)
  > Applicable to places:
    + without light, vibrations, thermal flux (no harvesting)
    + Where EM propagation is problematic (fading)
  > Principle:
    + use a cable which initially emits all along its length to detect and localise the differents sensors
    + Switchable antennas distributed along the cable (***part of the WG***)
  > Developments:
    + Structure of the leaky wave cable
    + Technology for the switching (MEMS ? Others ?)
    + Architecture of this plug-in system
    + Management of the signals (EM + control + queries + data)
  > Above all: keep the cable as passive as possible (reliability)

Some Ideas to work upon with WG1/2/3/5

» Self-adaptive focusing schemes for WPT: iterative search/beam/focus (WG1/WG3/WG5)

> Principle: a smart antenna (possibly dedicated to WPT for charging wireless sensors and terminals) detects and localises the items to be powered, then uses beamforming to focus its EM broadcasts onto the

> Phases: search / localise / beam & focus with possible iterative process

> Need of beamscanning antenna system

> Need to consider co-operative or non-cooperative solutions (between the smart antenna and the wireless mobile terminals)

> Need to detect a temporary obstacle (because of potential safety issues)

Some Ideas to work upon with WG1/2/3/5

» Artificially EM absorbing materials, with embedded antennas or distributed EM power converters (WG3):

> Justification: need of special EM objects that absorb as much energy as possible in all frequency bands (serves both WPT and EMH)

> Principle: use 3D printing to embed high efficiency antennas layered on top of one another

> Wideband antennas are not a good (efficient solution): for a given surface, you need more antennas for the higher frequency bands to get as much power as possible

> Optimise the distribution of antennas in the structure to get as much power as possible and be as multi-standard as possible

> How to connect the various antennas ?

> NB: this subject can be later on combined with the smart cable and the self-focusing solutions

Some Ideas to work upon with WG1/2/3/5

» Diode-less frontend schemes: various possible schemes (WG1/WG2/WG3)