



## HLPF 2022 SDG Learning Session 9

### Innovative Tools for Target Setting, Peer Learning and Policy Dialogue on SDG 4 and SDG Competencies



Tuesday 12<sup>th</sup> July, 2022

# World Class Quality Green IT Education: Firsthand Experience in Transnational PERCCOM and Genial Masters Programs

Presenters (EMJMD Genial Full Partners):

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Professor Eric Rondeau, Professor Jean-Philippe Georges (University of Lorraine)

Professor Karl Andersson, Associate Professor Solomon Oyelere (Lulea University of Technology)



# Outline of Presentation

- ❑ Introduction to the case studies of world quality Green IT education (Associate Professor Ah-Lian Kor)
- ❑ How do the case studies support SDG4 and other SDGs? (Professor Eric Rondeau)
- ❑ What is the successful innovative operational framework for global collaboration in PERCCOM and Genial? (Professor Jean-Philippe Georges)
- ❑ What are the impacts and best practices for PERCCOM and Genial? (Associate Professor Solomon Oyelere and Professor Karl Andersson)



# Introduction to the case studies of world class Green IT education

- ❑ Two successful case studies: EU Funded EMJMD PERCCOM and EMJMD Genial
- ❑ EMJMD PERCCOM (Pervasive Computing and Communications for Sustainable Development)
  - Pioneer of joint postgraduate provision of Green IT education in Europe
  - 2012-2019
  - 5 Cohorts of students from 39 countries
  - Consortium: 3 Full Partners and 15 International Associate Partners
  - <https://en-gb.facebook.com/PERCCOM/>
- ❑ EMJMD Genial (Green Networking and Cloud Computing)
  - 2019-2025
  - 4 Cohorts of students
  - Consortium: 3 Full Partners (University of Lorraine, Leeds Beckett University, Lulea University of Technology) and 30 International Associate Partners



## ❑ Primary goals

- EMJMD PERCCOM: Promote environmental awareness and equip ICT professionals with Green IT-related competencies for building cleaner, greener, more resource, and energy-efficient cyber-physical systems.
- EMJMD Genial: Train ICT professionals and equip them with green IT skills/competencies to design and implement sustainable ICT applications and services.

## ❑ Success Stories

- Number of applications: Cohort 1 (150 applicants); Cohort 2 (450 applicants); Cohort 3 (717 applicants)
- EMJMD PERCCOM: 88 trained ICT professionals in pervasive computing and communication technologies with embedded green IT skills. Our survey results in 2019: 44% are in academia (including PhD study), 40% in specialist IT jobs and 16% in non-IT jobs.
- EMJMD Genial: training of Cohort 1 (19 students) and Cohort 2 (21 students) in Green Networking (UL); Green ICT (LBU); Green Cloud Computing (LTU). Expected 100 trained ICT professional with green IT skills by 2025.



# How do the case studies support SDG4 and other SDGs?

## Quality education in IT (SDG4):

- ☐ Offer IT technical training that is meaningful for the learner in his or her professional and personal life and in society
- ☐ Instilling a vision of ecology, sustainability, well-being, community life and cooperation, whereas the educational world is often focused on training competitors

## Addressing global warming in IT (SDG13):

- ☐ Change the Moore's Law paradigm to a frugal IT paradigm.
- ☐ Have a holistic vision in the IT engineering phases (from manufacturing, to use, to recycling).
- ☐ Offer uncompromising digital solutions by providing the best IT service to the user while serving the planet.
- ☐ Offer intelligent solutions to reduce the impact of human activities on our planet.

### **A Sustainable IT education with a difference:**

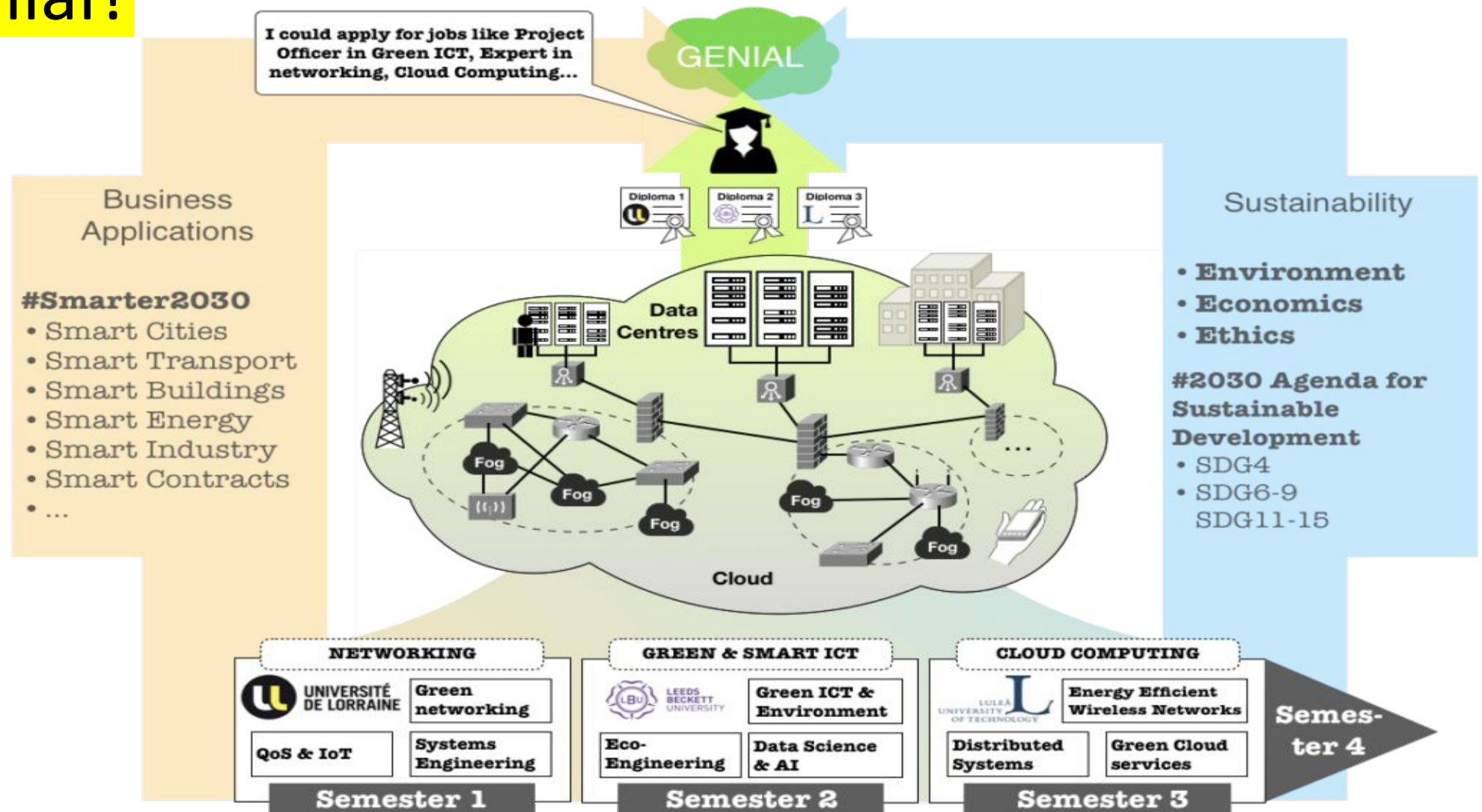
- ☐ Promote the value of each person's skills, which may be technical or more societal in nature
- ☐ Encourage the creation of a vision of a digital world through different sensitivities for a better use in everyday life (among children, elderly, men, women) in various cultures and social categories.

### **Strengthen global partnerships (SDG17):**

- ☐ Train student cohorts that are not only gender-balanced, but also internationally diverse to encourage exchange and contradictions from different backgrounds.
- ☐ Train students through a panel of experts (academic, industrial) coming from all continents to show particularities but with a common commitment to preserve our planet.

# What is the successful innovative operational framework for global collaboration in PERCCOM and Genial?

- Genial Overview



# Genial Programme Structure

- Semester 1: Network, Green Networking and Eco-Design (Université de Lorraine, France)
  - (a) Communication protocols;
  - (b) Internet of Things;
  - (c) Quality of Service and Quality in Sustainability;
  - (d) Green Networking
- Semester 2: Smart and Sustainable Computing (Leeds Beckett University, UK)
  - (a) Green ICT and Environment;
  - (b) Eco-Engineering;
  - (c) Data Analytics and Visualisation;
  - (d) Intelligent Systems and Robotics
- Semester 3: Wireless Communications, Green Storage and Cloud Computing (Luleå University of Technology)
  - (a) Network Programming and Distributed Applications;
  - (b) Energy Efficient / Advanced Wireless Networks;
  - (c ) Green Cloud Services
- Semester 4: Masters Research and Dissertation (in full/associate partner institution)
- Annual Summer School – Invited Lectures; MSc Thesis Defense; Research Posters



# Awards

- Masters in Complex System Engineering(Ingénierie des systèmes complexes): University of Lorraine (France);
- Masters in Information and Technology -Sustainable Computing: Leeds Beckett University (UK) (note: it is MSc Information and Technology with a specialised route in Sustainable Computing accredited by BCS.
- Masters in Computer Science with specialism in Pervasive Computing and Communications for Sustainable Development: Luleå University of Technology (Sweden).
- Genial Joint Diploma Supplement



# What are the impacts and best practices for PERCCOM and Genial?

## Within Academia

- ☐ New cooperation in research activities
- ☐ Improved pedagogical practices and methodologies
- ☐ Doctoral students – leading to academic career pathways
- ☐ Acquisition of cutting edge and sustainability-related expertise
- ☐ Collaboration – administrative, teaching and research
- ☐ Exchange of good practices



## Outside Academia

### ☐ Environmental impact

- Reduced pollution
- Reduced earth resource use

### ☐ People - Upskilling and progression

- Closing digital divide
- Increased employment
- Increased effective international partnerships

### ☐ Profit

- Reduced environmental costs
- Reduced capital and operational costs
- Increased quality of service, quality of experience, and quality of life

# Thank You

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