# Introduction to IEEE TSCGCC

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Chair, TSCGCC, IEEE Communications Society

IEEE Online Conference on Green Communications 2013

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# Scope: Green Communications and Computing - General

- Make communications and computing networks greener
- Use communications and computing networks for green objectives

# Scope: Green Communications and Computing - Topics (1)

- Green wireline/wired communications: Green wired access networks, Green optical communications and networking, Green Internet backbone networks, Green wireline communications with QoS constraints, Green service provisioning and content distribution,

- Green wireless communications: Green wireless cellular communications and networking, Green fixed wireless access communications and networking, Green cognitive radio, Green adhoc and sensor communications and networking, QoS provisioning and resource management in green wireless networks,

- Green computing networks (such as Green cloud computing, Green data centers)

- Green electricity transmission and distribution systems

# Scope: Green Communications and Computing - Topics (2)

- Electromagnetic pollution mitigation
- Software architecture for green communications and computing
- Hardware architecture and chip designs for green communications and computing
- Relevant areas
  1. Economic concerns for green topics
  2. Green computers, servers, and associated subsystems
  3. Green air conditioning
  4. ...

# TSCGCC Introduction

- Full name: Technical Subcommittee on Green Communications and Computing (TSCGCC), IEEE Communications Society

- Established in Dec 2011

- Official mailing list: tcgcc@comsoc.org

- Official web links: `http://www.comsoc.org/about/committees/emerging#gcc`, `https://sites.google.com/site/gcccomsoc/`

- The number of official TSCGCC members (globally):
  - About 50 in Dec. 2011, who have been treated as Founding Members of TSCGCC
  - 260 on June 6, 2012
  - 399 on December 5, 2012
  - 493 on June 12, 2013
  - 526 on October 25, 2013

# TSCGCC online communities (1)

- IEEE Green Communications and Computing (GCC) Group at Linkedin.
    - The number of members:
        * 242 on June 6, 2012
        * 505 on December 5, 2012
        * 806 on June 12, 2013.
        * 973 on October 25, 2013
    - URL: `http://www.linkedin.com/groups?trk=anet_ug_hm&gid=4233179&home=`

# TSCGCC online communities (2)

- IEEE Green Communications and Computing (GCC) Group at Linkedin.
  - Subgroups: Green Smart Grid Communications; Green Cognitive Communications and Computing; Green Data Center and Cloud Computing; Energy Harvesting; Cloud RAN (Radio Access Network); Green Standardizations; Green Wireline Communications and Networking; Software Defined Networking / Software Defined Networks (SDN); Smart Device to Device Communications; Communications, computing, and systems for green (sustainability) objectives
- TSCGCC Discussion Group at IEEE ComSoc web:
  - The number of members on Oct. 25, 2013: 57.
  - URL: `http://community.comsoc.org/groups/tscgcc`

# TSCGCC online communities (3)



**IEEE Green Communications and Computing (GCC)** 🔒

976 members

Discussions    Promotions    Jobs    Members    Search    Manage

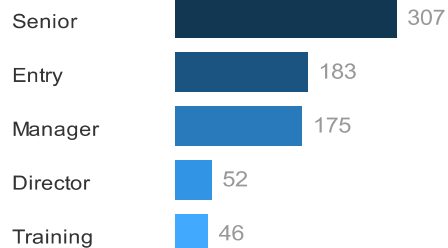**Summary**    Demographics    Growth    Activity

SHARE
THESE
STATS

**STARTED ON**

December 29, 2011

**MEMBERS**

# 976

**SENIORITY**

| | |
|---|---|
| Senior | 307 |
| Entry | 183 |
| Manager | 175 |
| Director | 52 |
| Training | 46 |

**COMMENTS LAST WEEK**

# 0

**LOCATION**

# 5%
San Francis...

**FUNCTION**

# 27%
Education

# TSCGCC online communities (4)

# TSCGCC online communities (5)

**IEEE Green Communications and Computing (GCC)** 🔒          976 members   *i*   ↗

Discussions     Promotions     Jobs     Members     Search     Manage

Summary   **Demographics**   Growth   Activity

**LOCATION**

# 5%
San Francisco Ba...

Looking for group members in a specific area? Members can do advanced searches within the group.

**SENIORITY**

31% Senior

**FUNCTION**

27% Education

**INDUSTRY**

26% Telecommu...

SENIORITY   FUNCTION   **LOCATION**   INDUSTRY

San Francis...   ▉ 5%
Singapore   ▉ 3%
China   ▉ 3%
Greater Ne...   ▉ 3%
Greece   ▉ 2%
Bengaluru ...   ▉ 2%

# Special Interest Groups (SIGs) in TSCGCC (1)

- SIG on Green Cellular Networks (SIGGCN)
  - Chair: Teng Joon Lim, National University of Singapore, Singapore
  - Vice-Chair: Tony Q. S. Quek, Singapore University of Technology and Design, Singapore
  - Vice-Chair: Marios Kountouris, Supelec, France
  - Vice-Chair: Shuguang Cui, Texas A & M University, USA
  - Advisor: Kwang-Cheng Chen, National Taiwan University, Taiwan
- SIG on Green Cognitive Communications and Computing Networks (SIGGCCCN)
  - Chair: Ekram Hossain, Dept. of ECE, University of Manitoba, Canada
  - Vice-Chair: David Grace, The University of York, UK
  - Vice-Chair: Liqun Fu, The Chinese University of Hong Kong, Hong Kong
  - Advisor: Ying Chang Liang, Institute for Infocomm Research (I2R), A*STAR, Singapore

# Special Interest Groups (SIGs) in TSCGCC (2)

- SIG on Green Smart Grid Communications (SIGGSGC)
  - Chair: F. Richard Yu, Carleton University, Canada
  - Vice-Chair: Yi Qian, University of Nebraska-Lincoln, USA
  - Vice-Chair: Yan Zhang, Simula Research Laboratory & University of Oslo, Norway
  - Advisor: Victor C.M. Leung, The University of British Columbia, Canada
- SIG on Green Data Center and Cloud Computing (SIGGDCCC)
  - Chair: Chuan Heng Foh, Nanyang Technological University, Singapore
  - Vice-Chair: Yonggang Wen, Nanyang Technological University, Singapore
  - Vice-Chair: Joel Rodrigues, University of Beira Interior, Portugal
  - Vice-Chair: Debojyoti Dutta, Cisco Systems, Inc., USA
  - Advisor: Fred Baker, Cisco Systems, Inc., USA
  - Advisor: Rodney S Tucker, University of Melbourne, Australia
  - Advisor: Moshe Zukerman, City University of Hong Kong, Hong Kong

# Special Interest Groups (SIGs) in TSCGCC (3)

- SIG on Energy Harvesting Communications (SIGEHC)
  - Chair: Chau Yuen, Singapore University of Technology and Design, Singapore
  - Vice-Chair: Lei Shu, Guangdong University of Petrochemical University, China
  - Vice-Chair: Chin Keong Ho, Institute for Infocomm Research, Singapore
  - Vice-Chair: Woon Hau Chin, Toshiba Research Europe Limited, UK
  - Advisor: Hsiao-Hwa Chen, National Cheng Kung University, Taiwan

# Supported by or in-cooperation with TSCGCC (1)

- Green Track in Symposia on Selected Areas in Communications of IEEE Globecom 2012/2013/2014, IEEE ICC 2013/2014

- IEEE ICC 2013 Panel on Collaborative Programs in Green Communications: Successful Cases and Key Remaining Research Challenges

- IEEE GLOBECOM 2O12 International Workshop on Cloud Base-Station and Large-Scale Cooperative Communications

- IEEE INFOCOM 2013 Technical Panel on Green Communications: Can We Achieve Load Proportional Energy Use

- IEEE ICC 2012/2013 Workshop on Energy Efficiency in Wireless Networks & Wireless Networks for Energy Efficiency (E2Nets)

- 2012 COST IC1004 + iPLAN Joint Workshop on Small Cell Cooperative Communications

- IEEE GLOBECOM 2012 IEEE Workshop on Smart Grid Communications: Design for Performance

- IEEE GLOBECOM 2012 Workshop ON Wireless Cloud Computing and Networking

# In cooperation with or supported by TSCGCC (3)

- IEEE INFOCOM/ICC/GLOBECOM 2012 Panel on Green Communications and Computing
- IEEE GLOBECOM 2013 International Workshop Cloud Computing Systems, Networks, and Applications (CCSNA)
- IEEE PIMRC 2013 Technical Tutorial on Green Heterogeneous Small-cell Network
- IEEE PIMRC 2013 Special Session on Energy Harvesting Communications
- IEEE International Conference on Green Computing and Communications 2013
- IEEE Online Green Communications Conference 2012/2013
- International Conference on Telecommunications
- IEEE WCNC 2013 Panel on Green Cellular Networks
- IEEE CCNC(Consumer Communications and Networking Conference) 2013 Track on Green Communications and Computations
- 2013 International Conference on Network of the Future
- 2013 Tyrrhenian International Workshop on Digital Communications Green ICT

# In cooperation with or supported by TSCGCC (3)

- Special Issue, International Journal of Distributed Sensor Networks, called in 2013

- Special Issue on Green Communications, Elsevier Computer Networks, called in 2013

- Feature Topic Issue on Context Aware Communications and Networking, IEEE Communications Magazine, called in 2013

- Special Issue, Network Protocols and Algorithms, called in 2013

- International Journal of Cloud Applications and Computing, called in 2013

- Special Issue on Smart Grid Communications Systems, IEEE Systems Journal, called in 2012

- EURASIP Journal on Wireless Communications and Networking Special Issue on Green Radio, called in 2012

- Special Issue on Wireless Sensor Networks with Environmental Energy Harvesting, International Journal of Sensor Networks, called in 2012

- Speical Issue on Green Cognitive and Cooperative Communication and Networking, ACM/Springer Mobile Networks & Applications (MONET), called in 2012

- Speical Issue on Mobile Cloud Computing, IEEE Wireless Communications, called in 2012

# Standardization relations and efforts

- TSCGCC members have broadly involved in green relevant standardizations activities in different standardization groups or bodies, such as IEEE (such as IEEE 1900.7, IEEE 1888), 3GPP, ITU-T, ATIS, ETSI, CSCI, Broadband Forum.

- TSCGCC have proposed an IEEE Research Project on Vision for Green ICT Standardizations, which has been approved by IEEE ComSoc Standardization Program Development Board (CSPDB) conditioned on completing the organization structure of the project.

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Thank you for your attention!
Welcome questions!