



SMALL CELL FORUM

Solving the HetNet puzzle

2017-18 Membership Highlights and Workplan for 2018-19

June 2018



Small Cell Forum Membership 2017-18



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Thank you for being a member. Here's what your participation has achieved this past year, and a look ahead to what we have planned in 2019...

Contents



- **2017-18 Highlights**

- **Market research** shows deployments scaling and a critical time to establish market share. Collaborating to identify and address barriers will result in larger market for all
- **Regional events** provided a platform for regional operators to articulate their densification requirements and for suppliers to propose best practice solutions
- **Global Technology Alignment** has been progressed by the publication of 10 year roadmaps for densification technologies, with alignment across industry SDOs initiated at Partner's day
- **Enterprise Engagement** has been strengthened through our advisory council and has reached out to hospitality, healthcare and commercial property verticals
- **Pro-densification Policy** has lobbied government to harmonise and simplify approvals processes to deploy small cells, SCF recommendations are being cited and adopted

- **2018-19 Workplan**

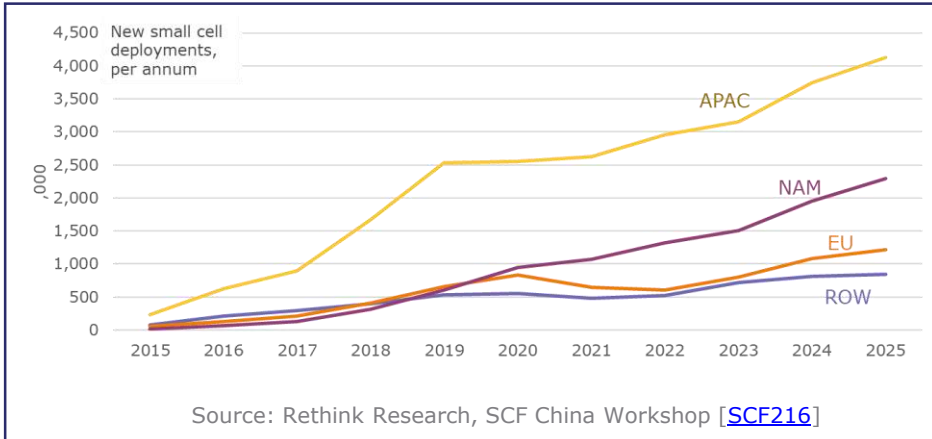
- **Candidate work items for three campaigns**

- **Ten ways to get more from your membership**

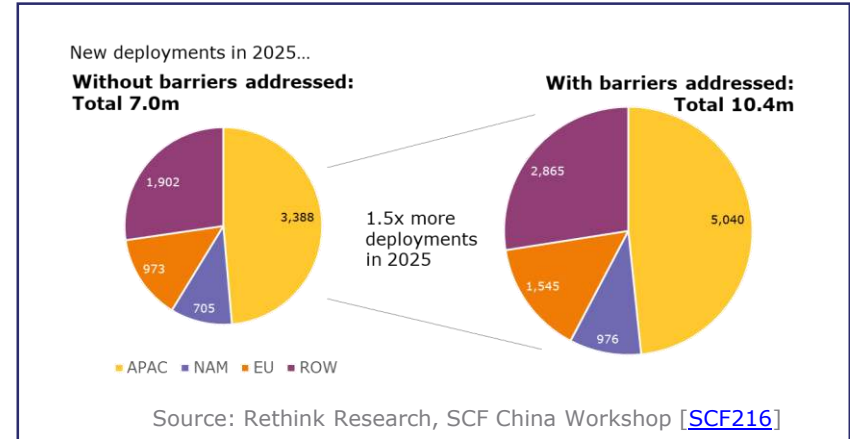
Market Research

Your membership has funded this market research:

- [[SCF050](#)] Small cells market status, Feb 18
- [[SCF194](#)] MNO survey Q417: HetNet deployment plans, driver and barriers
- [[SCF215](#)] Enterprise connectivity requirements, Feb18
- Member-only supporting data can be found at www.extranet.scf.io /fileshare/release reviewing/member extras/



**Deployments are starting to scale:
This is a critical time to establish market share**



**Collaborating to identify and address
barriers results in a larger market for all**

SCF Regional Workshops 2017-18



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Rural & Remote Summit Wyoming

July 18 [[register](#)]

US Partners Day

July 17 [[SCF201](#)]

LATAM Carrier Workshop

May 18

Europe: Small Cells World

May 18

China: Densification Path to 5G

[[SCF216](#)] May 18

Taipei workshop

Sept 18

Mumbai Densification Summit

Oct 17 [[SCF202](#)]

Providing a platform for regional operators to articulate their densification requirements and for suppliers to propose best practice solutions

Regional Workshop: Mumbai Densification Summit, Oct 17



Day 1: Industry Insights From Reliance Jio and Partners



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Day 2: Integration of requirements into SCF workplan

Keynotes &
Market Analysis

Product
development

Planning and
execution

Jio's partner
insights

Densification
Technology

Rural and
Remote

Enterprise
& Indoor

Urban
& Outdoor

- SCF, Jio, Rethink
- HetNet philosophy
- LTE-WiFi Coexistence
- Development model
- SON
- Multi generation converged core
- Network planning & deployments
- Automation journey
- Operations
- Technology labs



Takeaways: Six Requirement Themes

- 1 Data should be abundant and affordable - "Hyperdense is a must"
- 2 Costs must be reduced to be comparable to the Wi-Fi model
- 3 Telcos must accelerate to the speed and agility of web-scale IT
- 4 Mobile network assets need to be leveraged to deliver unmatched customer experiences
- 5 Automation must be unified E2E to support business goals & customer experience
- 6 Hetnet domains including RAN, unlicensed and backhaul need to co-exist, interwork and be manageable from common platforms

Regional Workshop: China Densification Path to 5G, May 18



Densification: Current (4G) needs, future (5G) value & success stories



Bringing efficiencies to network densification

Challenges & Opportunities in the Transition from 4G to 5G (CMRI)



中国移动通信
CHINA MOBILE



Drivers for small cells – coverage, capacity /offload, cost

The Optimization Strategy of Future Network Characterized by "Ultra High Speed Data"



Small cell mass deployment: What is really needed?

Miniaturization Test System Case Study in China Mobile



5G indoor coverage digitization starts from Day 0

4G to 5G evolution



LTE innovation as a pathway to 5G

China themes: Baseline configurations for 5G indoor coverage, digital transformation of operations, 5G minimum feature set

[[SCF216](#)] China Meeting Report. Slide decks on extranet/release reviewing/member extras/

Global Technology Alignment



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US Partner's day

Alignment on 10 year vision & roadmap for densification into the 5G Era



Virtualisation, Cloud, Edge

SON, MANO

Shared spectrum & Multi-operator

RAN standards

Deployment & operations

xhaul & cabling

Regulatory & government

New Business Models

Market engagement



[[SCF201](#)] report
Slide decks on extranet
/release reviewing
/member extras/

| SCF roadmap for Enterprise Indoor Business Models | | | | | 10 Years |
|---|---|--|---|--|----------|
| SCF roadmap for Virtualisation, Cloud, and Edge | | | | | 2027 |
| SCF roadmap for SON, Orchestration & Automation | | | | | 2027 |
| 2017 | 2020 | 2022 | 2027 | | |
| Now | 1-3 years | 3-5 years | 5-10 years | 10 year vision | |
| Reactive FCAPS Multi-vendor RAN-centric c-SON | Broad adoption of Multi-Generational Hybrid-SON SON evolution to layered hypothesis driven algorithms & expert systems Open RAN Instrumentation Multi-vendor SON Interoperability & orchestration with single MANO | Cross domain, inter-vendor optimization Automatized Scale Up/Down Open Data Collection and Analytics Framework hosting SON/Analytics applications Business level framework that includes policies | AI-Deep Learning for Automation, Service Orchestration of the complex variety of 5G services, anomaly detection, reasoning & action Application layer Hypervisor solutions | Zero touch self-configuration organises any deployment to operator acceptable quality. AI driven intelligent cross-domain orchestration jointly optimises network resources for E2E service QoE | |

Tech and IOP works:

- 10 year roadmaps [[SC110](#)]
- mmWave for 5G eMBB [[SCF197](#)]
- Slicing for 5G URLLC [[SCF199](#)]
- Edge computing made simple [[SCF014](#)]
- Private EPC Interop testing [[SCF208](#)]

Global Technology Alignment has been progressed by the publication of 10 year roadmaps for densification technologies, and alignment with industry SDOs at Partners day

Enterprise Verticals Engagement

Hospitality



Microsite and collateral:

<https://www.smallcellforum.org/enterprise/connecting-hospitality/>



Watch the Video

<https://youtu.be/c3BVIMMQEYY>

Healthcare



Targeted collateral

- Brochure [SCF205]
- Market analysis & Business case [SCF206]
- Ownership models [SCF210]
- Healthcare deployment stories
- <https://www.smallcellforum.org/enterprise/connecting-healthcare/>

Speaking at UK Health Show, Q318

Commercial Property

NEXT



[SCF214] "Making buildings small cell ready" outreach is attracting responses, incl. from RICS and TIA Smart building initiative

UK property workshop 2H18

Enterprise Advisory Council

AECOM

AEG

ATM

CAMDEN

CBRE

ExxonMobil

GM



JHM HOTELS
Empire Our Passion

KAISER PERMANENTE

MARRIOTT

wework



[[SCF215](#)] EAC's requirements and SCF's action plan to address them

SCF engages enterprise through our advisory council and has reached out to hospitality, healthcare and commercial property verticals

Pro-Densification Policy



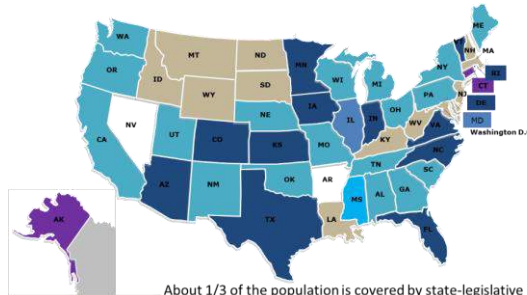
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Europe: SCF presented to COCOM (Commission + 28 MS regulators) in Brussels. Provided significant input and support to the rapporteur for the report aimed at advising national regulators on how best develop public policy to support small cell deployments.

US regulation differentiates small cells from generic mobile equipment, and includes them in the category of access points and repeaters (that are exonerated from the regulation applicable to base stations) => the regulatory /administrative burden is reduced in terms of administrative procedures, timing for processing the requests. [SCF190]



About 1/3 of the population is covered by state-legislative reform, in dark blue. State legislation is probable in nearly all remaining densely populated states, in light blue. IL is pending. A few states (AK & CT have largely equivalent reforms. A few states (NV & AK) have no or limited legislative sessions in 2018

ITU-T
TELECOMMUNICATIONS STANDARDIZATION SECTOR OF ITU

Series K
Supplement 9
(11/2017)

SERIES K: PROTECTION AGAINST INTERFERENCE

5G technology and human exposure to RF EMF

[IEC 62232] and [ITU-T K.100] have defined base station installation classes that are applicable to small cells deployed in countries with exposure limits based on international guidelines (ICNIRP). Each installation class including simple criteria such as the equivalent isotropic radiated power (EIRP) of all equipment at the site or installation height and are outlined in Figure 7.

SIMPLIFIED INSTALLATION RULES

| Installation class | S1 | S2 | S3 | S4 | S5 |
|-------------------------------|-------------------------|--|---|---|--|
| Max EIRP | N/A | ≤ 2 W | ≤ 10 W | ≤ 100 W | No limit |
| Maximum height above ground | None | None | 2.2 m | 3.0 m | 10 m (with 100 W) |
| Exclusion zone | None, except compliance | Provided in manufacturer's instructions, must fit, see chart on the poster | Provided in manufacturer's instructions | Provided in manufacturer's instructions | 10 m, in main lobe direction (10 m, in other directions) |
| Check pre-existing RF sources | N/A | N/A | N/A | Y/N, in main lobe direction | Y/N, in other directions |

(Source: Small Cells Forum and GSMA)

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Figure 7 – Simplified installation rules

[SCF012] included in "5G technology and human exposure to RF EMF", ITU <http://handle.itu.int/11.1002/1000/13473>

SCF has lobbied government to harmonise and simplify approvals processes to deploy small cells. SCF recommendations are cited by the EC, FCC and ITU



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Developing the workplan for 2018-19



Work plan structure

2017-18

Requirements Capture

MNO Survey

Regional Events

Enterprise Advisory
Council [SC215]

+Work item outcomes

+Member initiatives

+Partner liaisons



Campaigns

Global Technology Alignment

- Work item initiatives
-
-

Pro-densification Policy

-
-
-

Enterprise Engagement

-
-

Driven by gathered requirements, we have three long-term campaigns, each comprising a number of short-term work item initiatives

Global Technology Alignment



SCF's technology group compares requirements for scale densification with available and emerging standards to recommend architectures for given use cases and identify gaps

2018-19 Work Items & Initiatives:

- **Technology and 5G**

- Edge Computing Landscape
- Road-mapping SON and orchestration
- 5G small cell for mMTC
- 5G-WiFi Interworking
- Baseline 5G performance and configurations

- **Technology and 5G**

- xhaul for future networks
- Mapping architectures to deployment types
- nFQPI for 5G NR

- **Interoperability**

- HetNet SON PlugFest Sept18
- Implementation check lab

Pro-Densification Policy

Lobbying at all levels of government for simplified and harmonised approvals processes for deploying small cells

2018-19 Work Items & Initiatives:

- **Policy and Operations**

- European spectrum conference, Jun
- Consensus small cell definition acceptable for US municipalities
- SCF/MWF emissions measurements results
- EU-US densification policy updates
- Spectrum policy

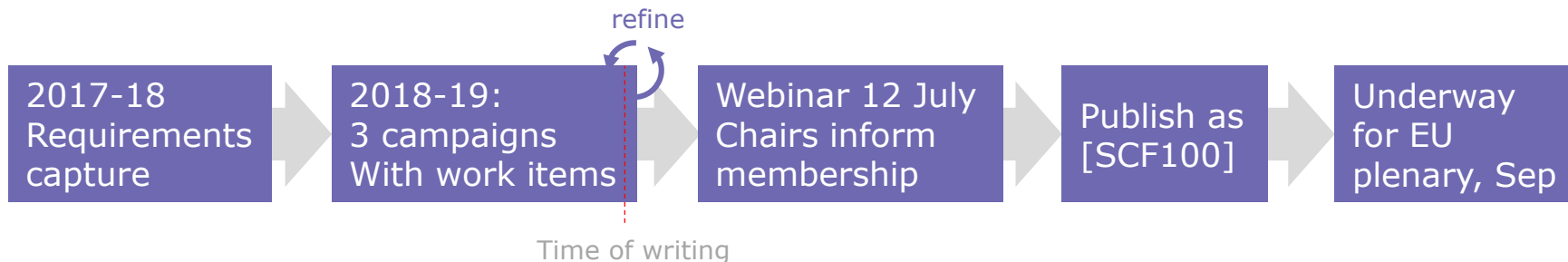
Enterprise Engagement

Enterprise is a fast growing market for cellular connectivity, and SCF is engaging to establish the value proposition and new commercial models for ownership and operation

2018-19 Work Items & Initiatives:

- **Enterprise Task Force, Advisory Council & Business Principles**
 - EAC requirements action plan [SCF215]
 - Aligned branding for 'digital indoor systems'
 - Healthcare conference Sep18: deployment stories requested
 - Commercial property: collateral package & outreach
 - Property workshop, London, Sept18
 - Shared spectrum business models

Process for developing the workplan and next steps



- **These slides describe the candidate set of work items for next year**
 - Opportunity now for members to propose new work item initiatives
- **These will be elaborated to all members at the 12th July webinar**
- **...and the resulting one-slide-per-work-item deck published as [SCF100]**
- **Interested parties should contact chairs to get involved**
- **Chairs should ensure work items are well underway for productive discussions at the Amsterdam Plenary, September**

And finally...

10 ways to get more from your membership



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- 1. Attend a working group call** [diary here: [extranet/resources/WebEx meetings](#)]
 - Marketing, Business, Technology & 5G, Interoperability, Policy, Operations, Enterprise Advisory Council, Operator Group
- 2. Contribute to a work item:** join the workplan webinar 12th July
- 3. Propose a new initiative or work item** [contact Steering Group or WG chairs]
- 4. Submit a deployment story** [www.smallcellforum.org/resources/deployment-stories]
- 5. Leverage our release programme collateral** [www.scf.io],
and the member-only extras [<http://extranet.scf.io/filemanager/folder/7785>]
- 6. Ask for an introduction to another member** [memberservices@smallcellforum.org]
- 7. Become a working group chair/co-chair** [proposals to current chair, decided by 23 July]
- 8. Join the SCF Board** [apply by Fri 6 July, details: <https://extranet.scf.io>]
- 9. Present at an SCF regional workshop:**
 - Rural Summit in Wyoming July, 5G in Taipei, Sept. Commercial Property UK, Sept.
- 10. Participate in SCF events and plenary meetings** [<https://www.smallcellforum.org/events/calendar>]
 - Wyoming (Jul), Amsterdam (Sep), Taipei (Sep), San Jose (Dec), MWC19 (Feb)



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Thank you