

Analysis of Status of SA2 study FS_EnergySys & Proposed Way Forward

Ericsson



Rel-19 EnergySys

FS_EnergySys Status at SA#104



UID	Name	Acronym	Target (dd/mm/yyyy)	Old %	WID	New %	Change or comment
1010029	Study on Energy Efficiency and Energy Saving	FS_EnergySys	18/06/2024	55%	SP-231192	100%	Study has been completed

Progress since SA#103

- TR 23.700-66 v0.7.0 is submitted to TSG SA for information and approval
- 13 pCRs has been accepted for new solutions and study conclusions

Impacts and dependencies on other WGs:

- RAN dependent solutions require feedback from RAN WGs for normative work alignments.

Contentious issues

- The decision on whether new functionality to collect and calculate and the energy related information to be exposed will be defined by SA2 or SA5 will need coordination in SA plenary.

Next Steps

- Start the normative work based on the agreed conclusions for key issues (depending on the outcome from SA plenary discussion and related approved WID)

The FS_EnergySys Study claims to be 100% complete but there are significant gaps that require further study, e.g.:

- KI#1/2 The purpose: (exposure and/or energy credit control)
- KI#1/2 Architecture aspects for both SA2 and SA5 based solutions:
 - SA2: New NF or existing NFs, e.g., SMF, NWDAF how to support long term storage of usage info etc.
 - SA5: What additional info is needed in CHF and how to provide it, is new 5GC functionality needed.
- (positive) Feedback from RAN is unlikely unless it's clear what the information is needed for.
- If/how the solutions saves energy should also be considered.
- The SoH working method has not contributed to progress.



Rel-19 EnergySys – purpose of the solutions?

- There has been a distinct lack of discussion on the use cases or purpose of the solutions in TR 23.700-66. The closest thing to a Use Case and purpose would be the SA1 requirements in TS 22.261 6.15a “Energy Efficiency as a service criteria” where SA1 essentially outline a charging system based solution:
 - Energy consumption should be associated with charging information.
 - It is assumed charging events are assigned a corresponding energy consumption.
 - The 5G system shall provide a mechanism to include Energy related information as part of charging information.
 - In addition, the required reporting intervals span from hours to months and years indicating that there must be a long-term storage of the consumption related information.
- Ericsson strongly believe there should be a single solution that collects energy related information and calculates energy consumption to support: monitoring, exposure and energy credit control.



Rel-19 EnergySys – Why A Charging based solution?

- SA1 requirements in Rel-19 and further study proposals in Rel-20 point clearly towards energy credit solutions.
- Daily Energy limits is equivalent to Daily data volume limits and energy credit control is equivalent to existing credit control.
- The Charging system is already integrated with the backend BSS system for management of subscriber credits and limits. Energy credit limits and energy credit management is just an extension of an additional type of limits and credits.
- A 5GC solution for energy limits and energy credit control would replicate credit control functionality inside the 5GC and require new integration with backend systems for provisioning and management of energy limits and credits.
- TSG SA should ask SA2 to avoid duplication of credit control functionality and reuse SA5 defined functionality as applicable.



Rel-19 EnergySys – Should NFs be energy aware?

- A key point of Cloud Native Network Functions is that the application should focus on the business logic that they need to perform and with minimal abstract knowledge of the platform they execute on.
- Energy consumption, type of energy etc. are platform aspects and should only be brought into the CNF if it is necessary for the business logic it executes. Abstracted level of more general information is one possibility if new information is really needed.
- The current trend in KI#3 is that every 5GC NF needs to understand energy related information, not only relating to itself but also related to other NFs. We firmly believe that this is not aligned with cloud native principles.
- => SA2 should take a step back and (re)consider which NF(s) really need knowledge of energy related information and corresponding logic.

Rel-19 EnergySys-Summary & Proposal

Proposal 1: TSG SA should ask SA2 to avoid duplication of energy credit control/energy monitoring functionality.

- TSG SA can ask to reuse SA5 defined functionality as applicable or alternatively ask SA2 to avoid developing duplicated functionality.

Proposal 2: SA2 should resolve the open technical issues for KI#1 and 2 and finish the study.

- This should be done by clarifying what we want to achieve with KI#1 and 2 (purpose).
- Then, focus discussion on how to resolve technical issues.

Proposal 3: For KI#3, SA2 should be asked to take a step back and consider which NFs really need knowledge of energy related information and corresponding logic.

Proposal 4: SA2 should be asked to complete the study phase addressing open issues.

- **Observation: TR 23.700-66 is not 100% finished and should only be accepted for information by TSG SA.**