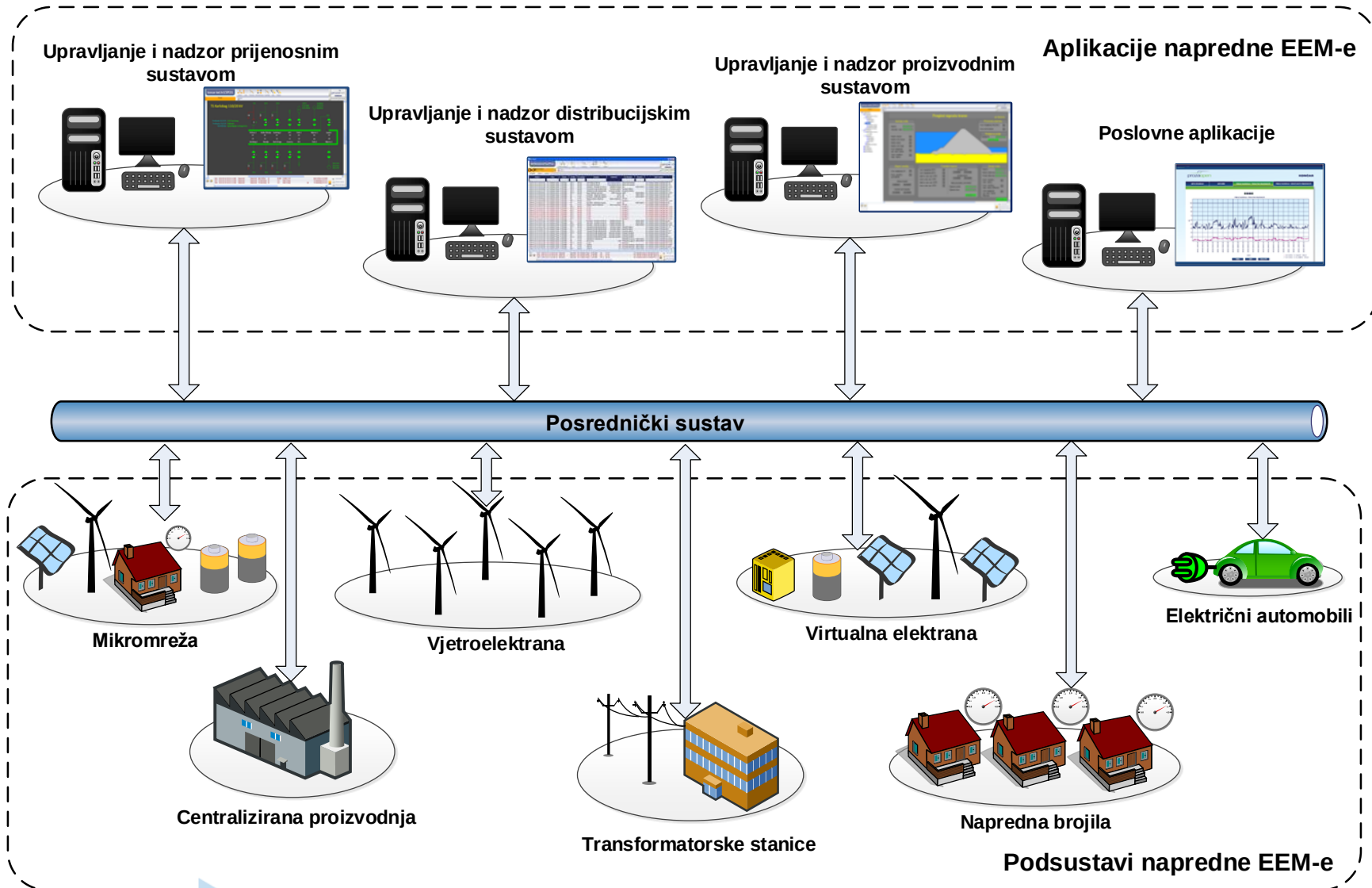


Primjena kibernetičkih industrijskih normi - Ključ upravljanja automatiziranim postrojenjima EES-a?

dr.sc. Stjepan Sučić

Razvoj napredne EEM-e

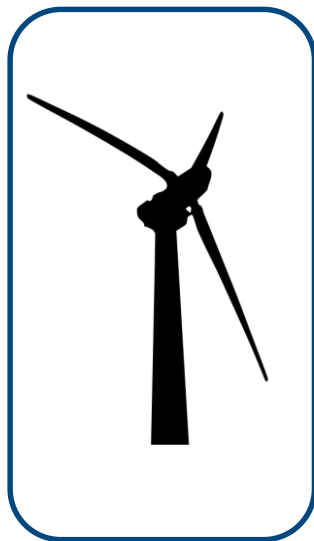


Digitalni blizanci: Što i zašto?

- Digitalni model stvarnog sustava
 - Fizikalne/statičke značajke
 - Procesne/dinamičke značajke

- SCADA
- Prikupljanje podataka
- Mjerenja
- Signali
- Upravljanje
- Automatizacija

Stvarni sustav



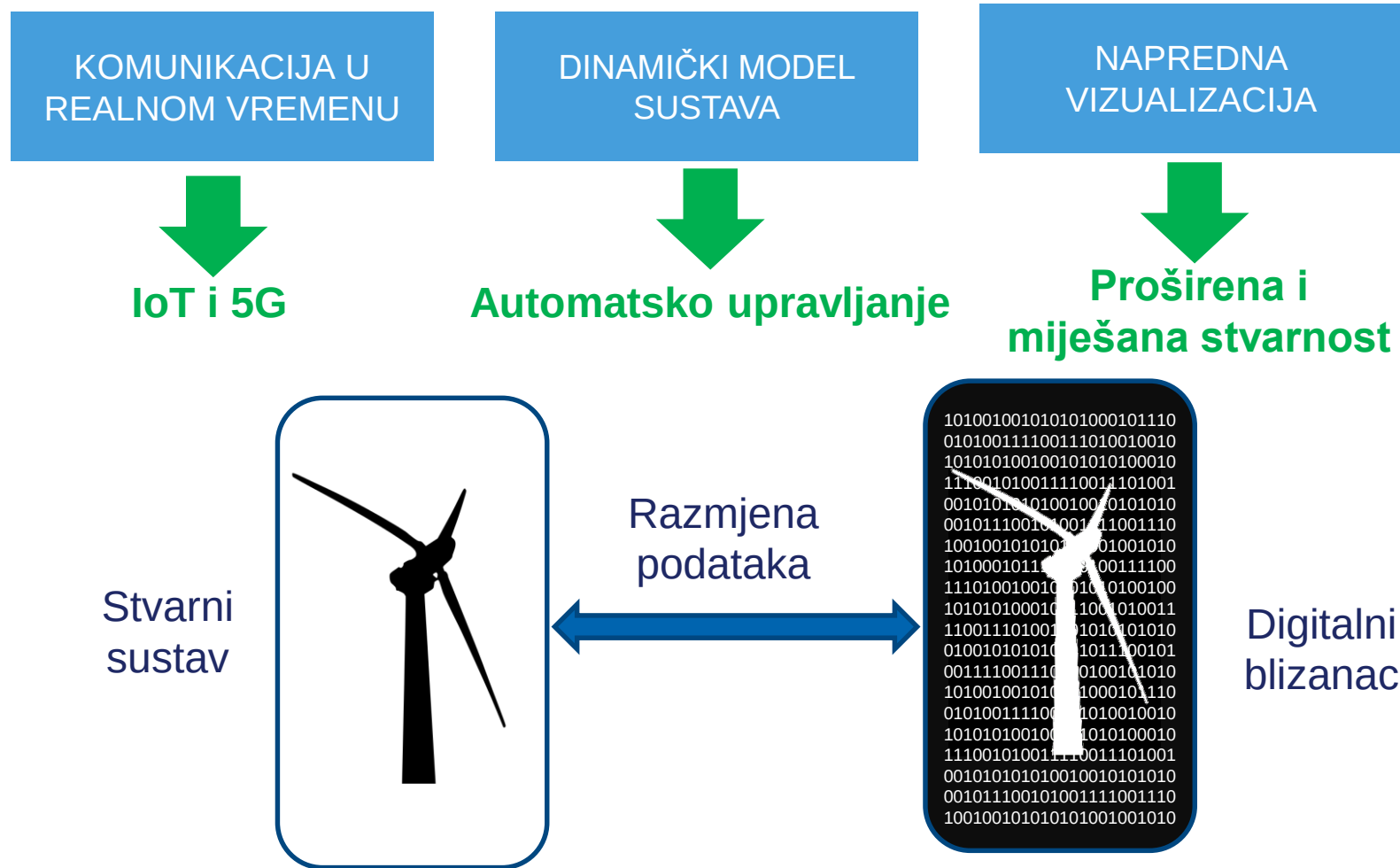
Komunikacija
u realnom vremenu

Digitalni blizanac

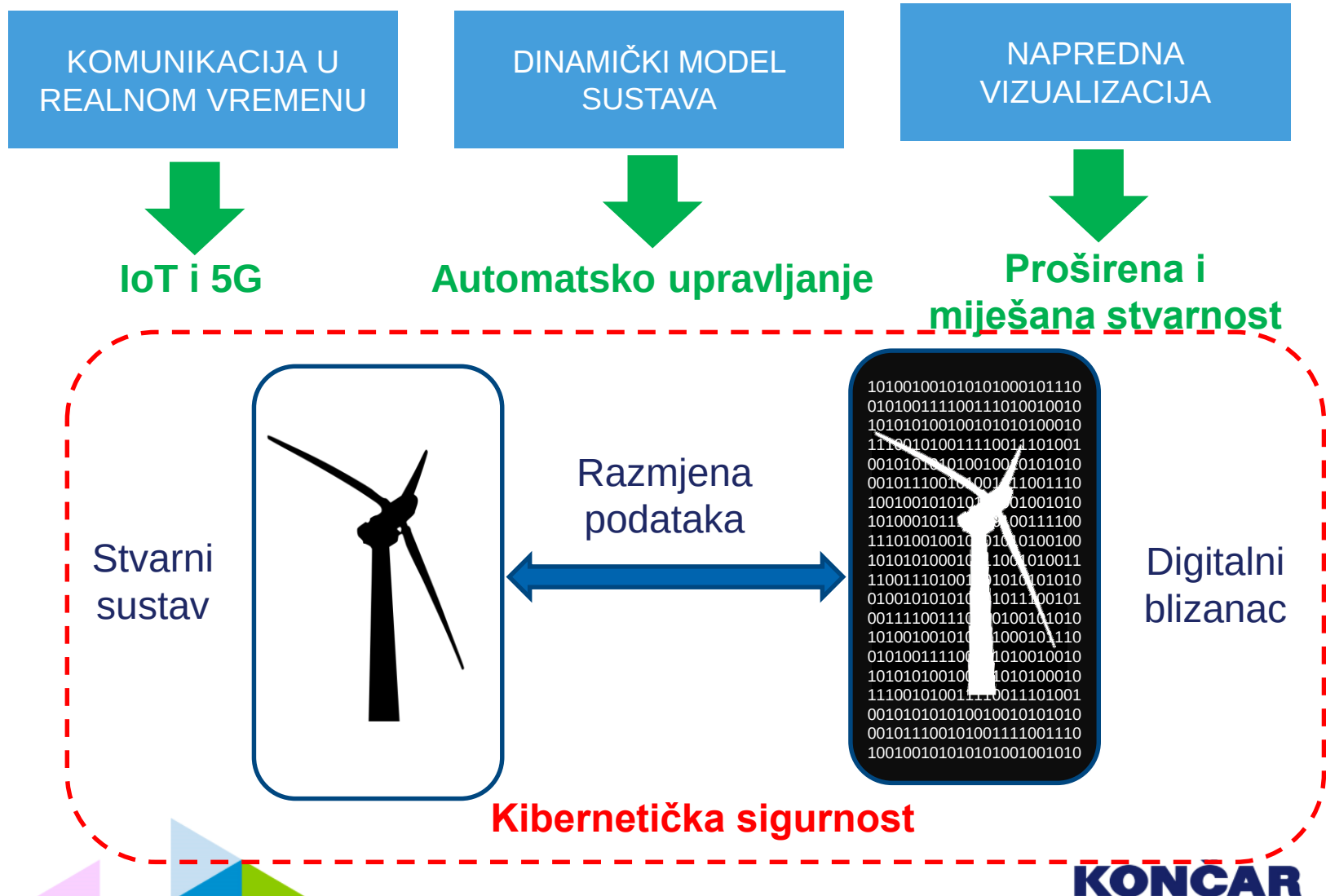


- 3D CAD
- Stvaranje podataka
- Model sustava
- Višeslojna simulacija
- Analiza
- Testiranje

Što nam je potrebno za digitalne blizance?

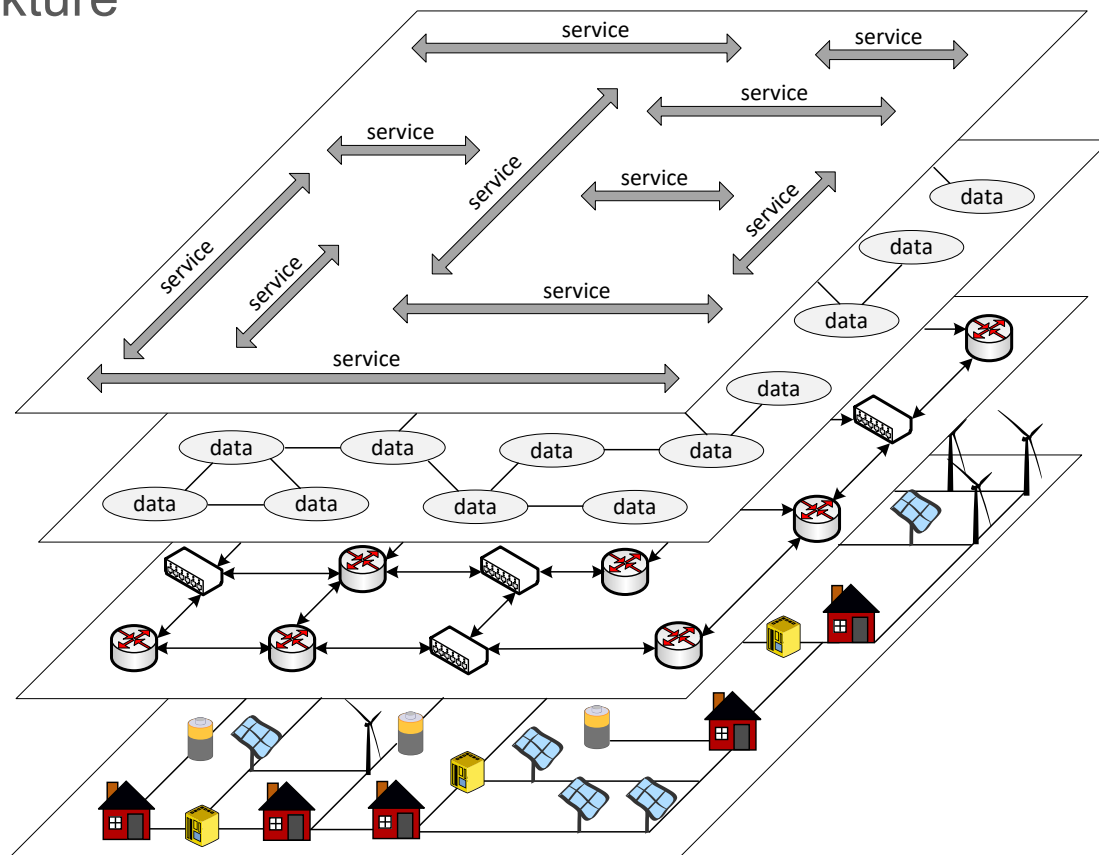


Što nam je potrebno za digitalne blizance?



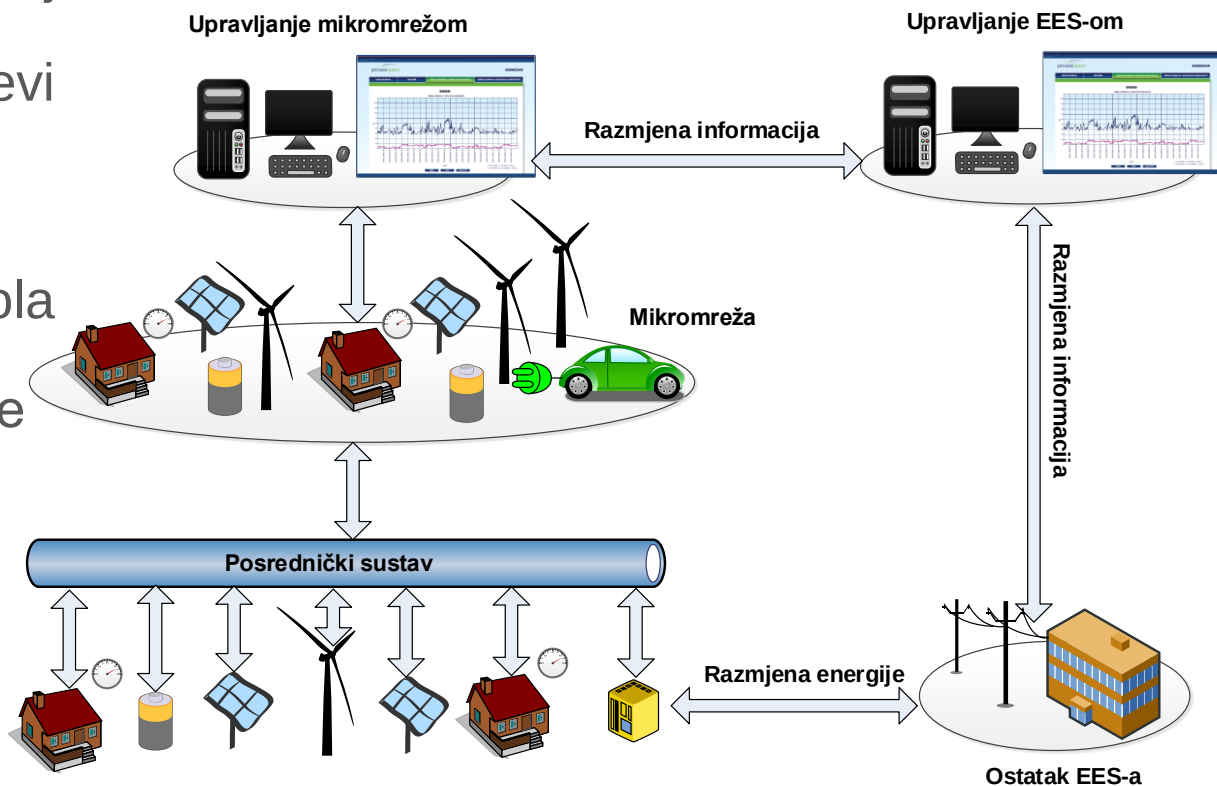
Standardizacija integracijskih sučelja

- Nove upravljačke arhitekture
- Velik broj proizvođača
- Višeslojna struktura
- Integracijski preduvjeti
- Tehnološka i platformska neovisnost
- Dugotrajna održivost
- Jedinstveni pristup



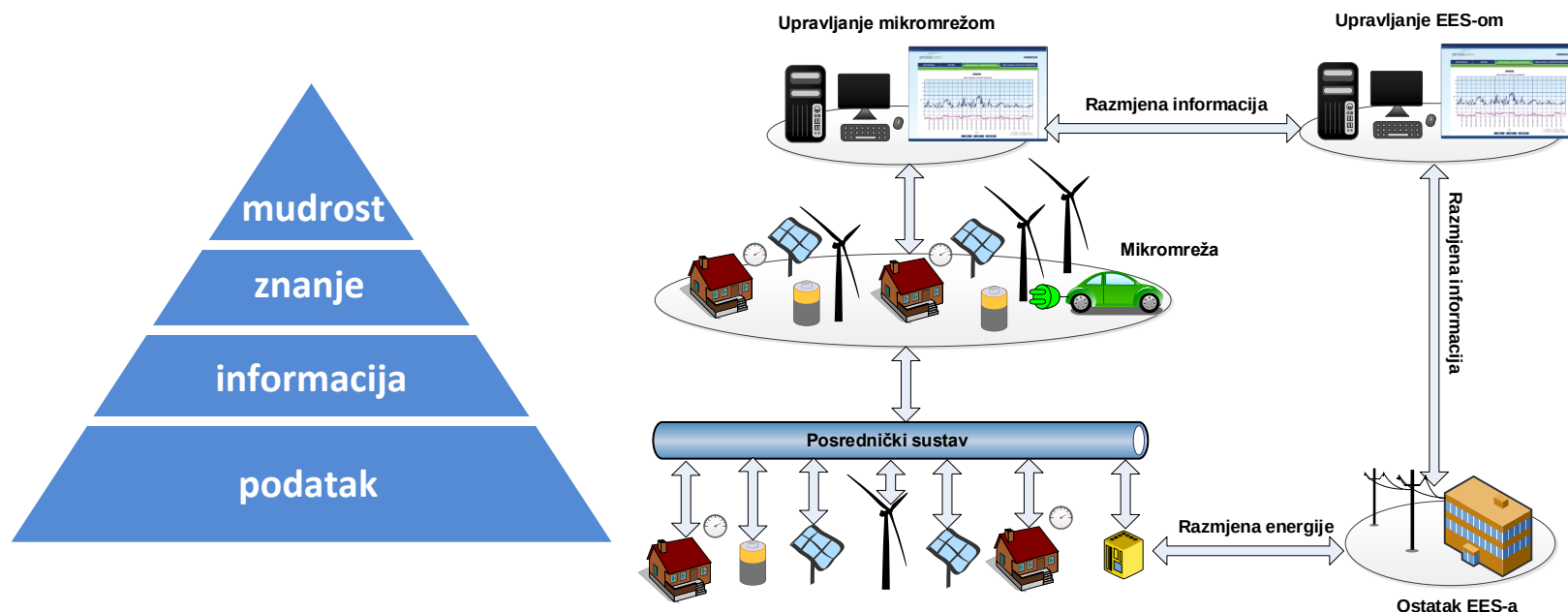
Automatizacija podsustava napredne EEM-e

- Integracija RIE
- Centralizirani->raspodijeljeni
- Novi funkcionalni zahtjevi
- *Plug & play* integracija
- Standardizacija protokola
- Semantičko modeliranje
- SCADA/DCS sustavi
- Kibernetička sigurnost



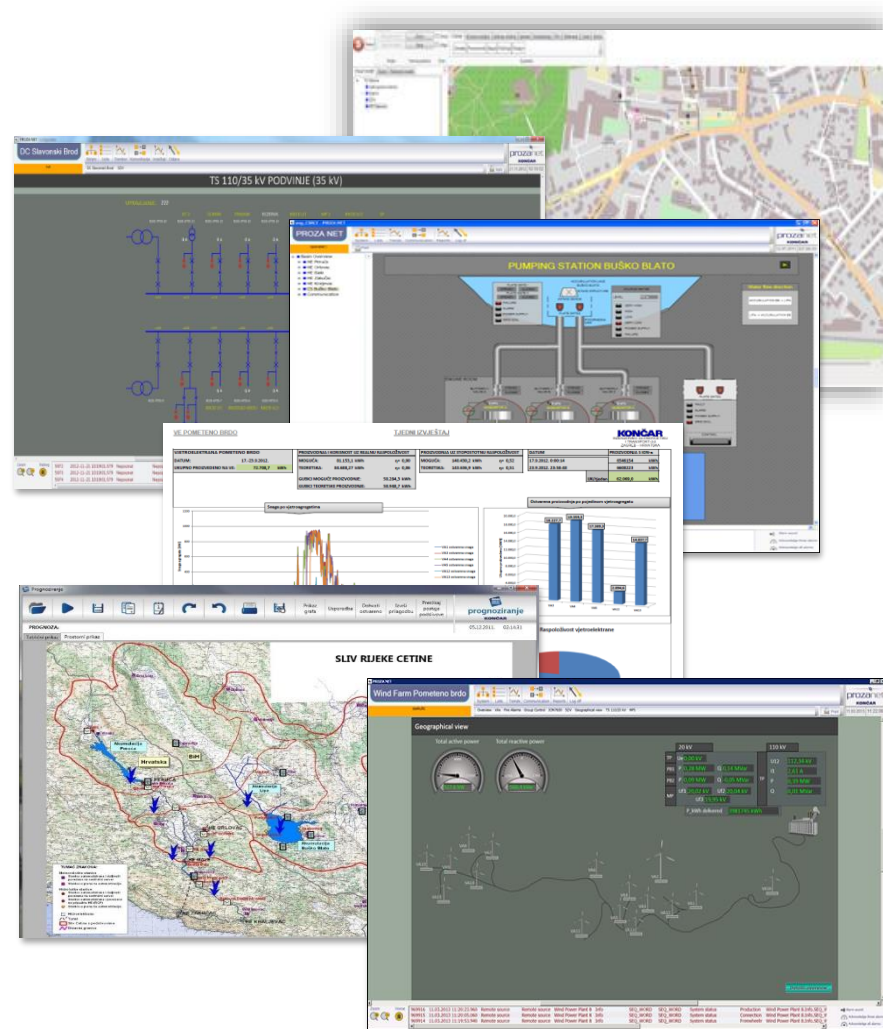
SCADA

- Digitalizirani podatak -> **informacija**
- Akvizicija podataka i njegovo pretvaranje u informaciju traži i **analitički** korak
- Supervisory Control and Data **Analysis**
- Preduvjet digitalne transformacije pametnih gradova



PROZA NET – Integracijska platforma

- Preko 500 instalacija
- Vlastiti razvoj
- Fleksibilnost primjene
- Struja, voda, plin...
- Regionalni lider
- Više od SCADA sustava



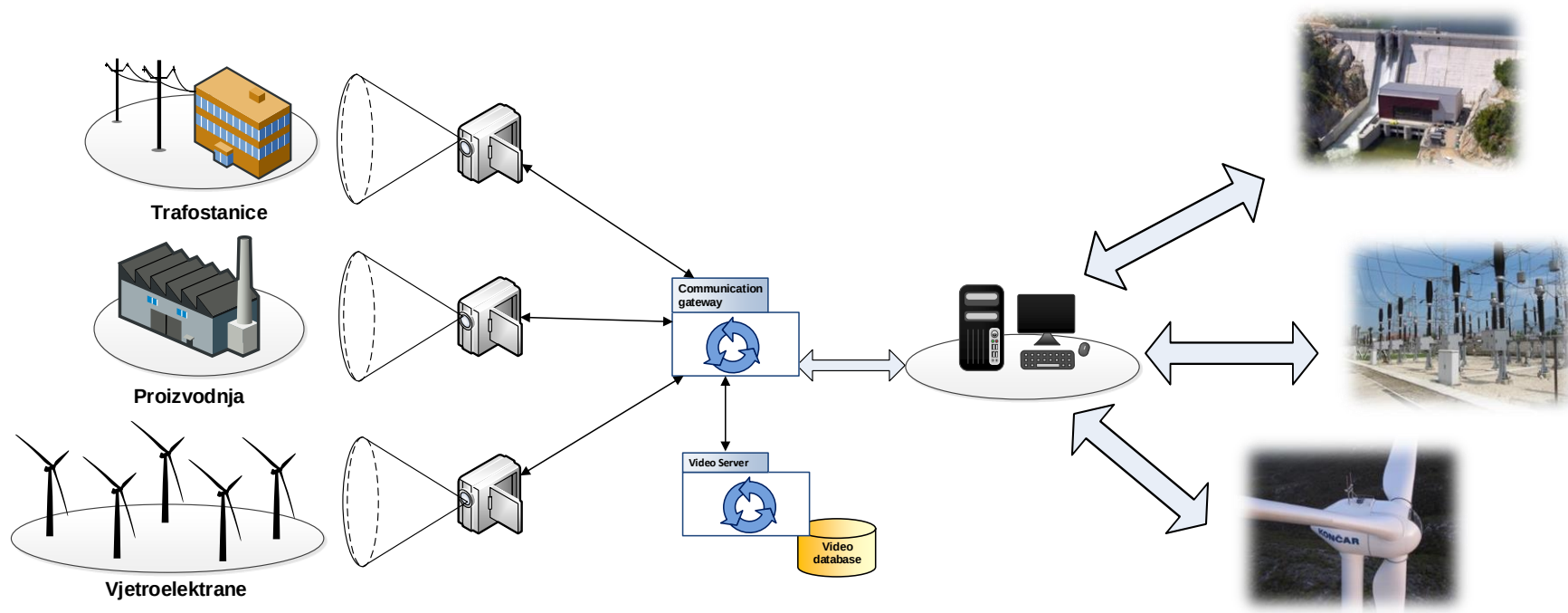
KONČAR

- Nadzor mrežne opreme
- Alarmi i događaji
- SCADA integracija
- Napredni monitoring
- Analiza rada opreme
- Preventivno održavanje



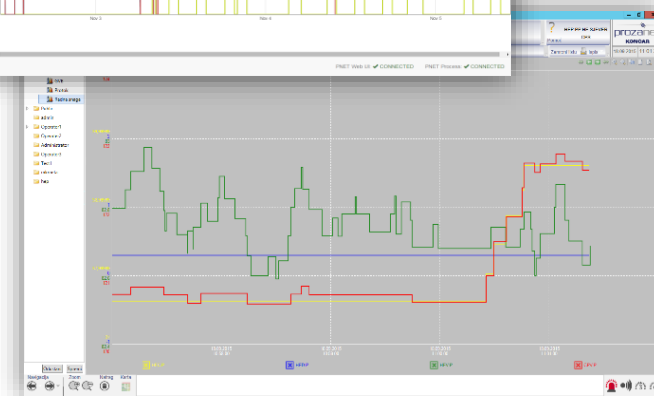
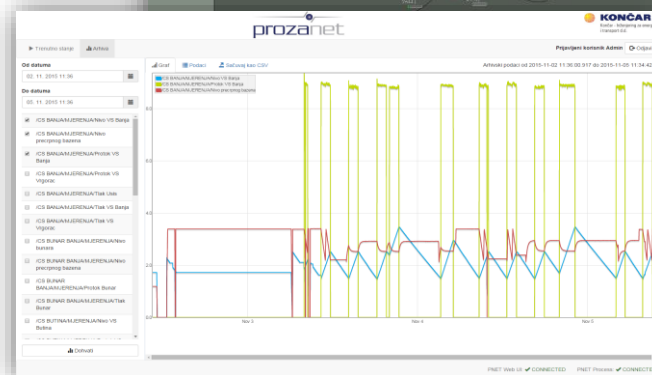
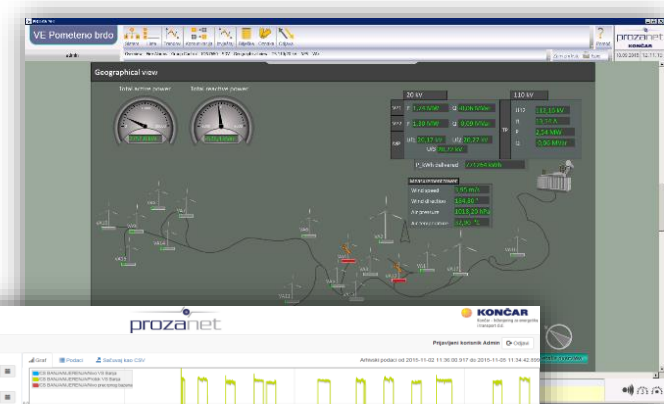
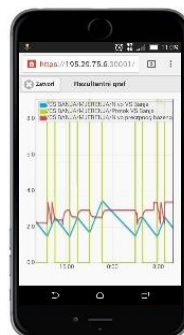
PROZA NET – Video nadzor

- Video nadzor industrijskih postrojena
- Integracija video kamera u SCADA sustav
- ONVIF video standard



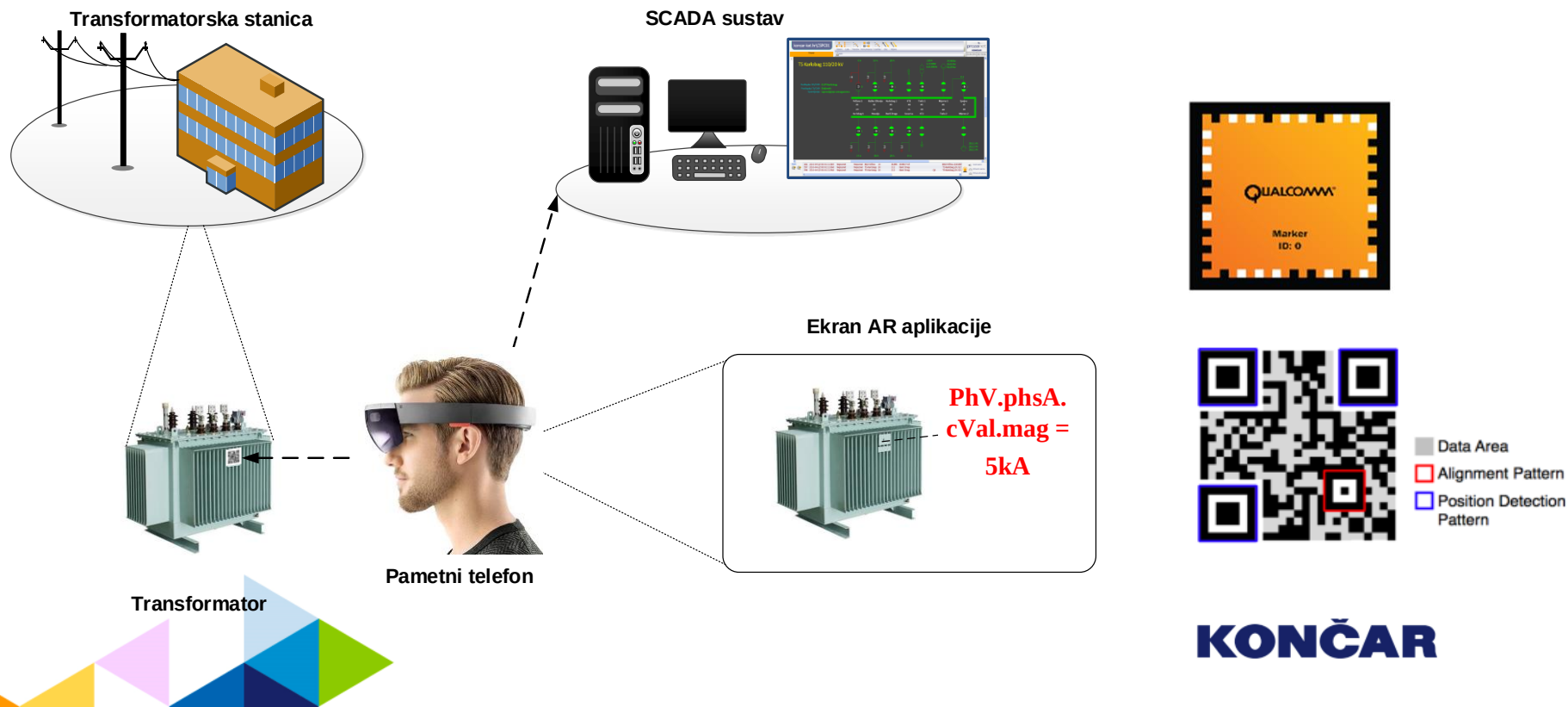
PROZA NET – Mobilna SCADA

- WS-Gateway
- Web HMI
- Mobilna aplikacija
- Izvještavanje i vizualizacija u stvarnom vremenu



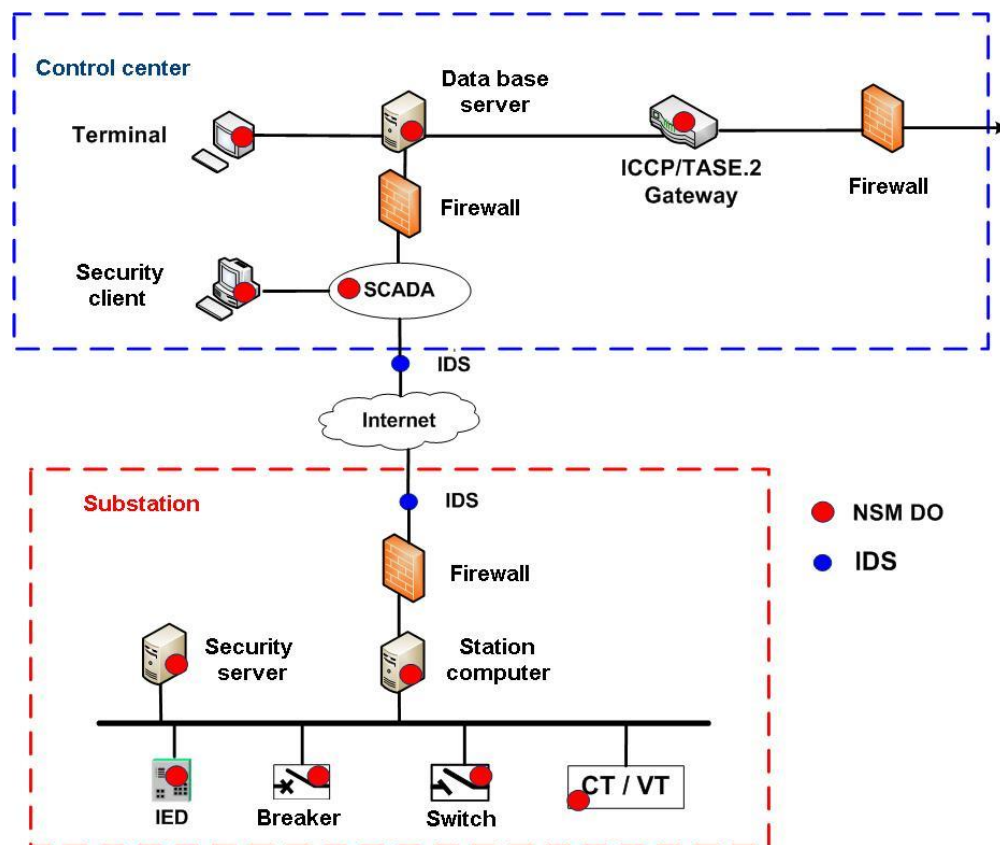
PROZA NET – Proširena stvarnost

- Proširena stvarnost industrijskih postrojena
- Primjena mobilnih i Hololens uređaja
- Vuforia & QR markeri

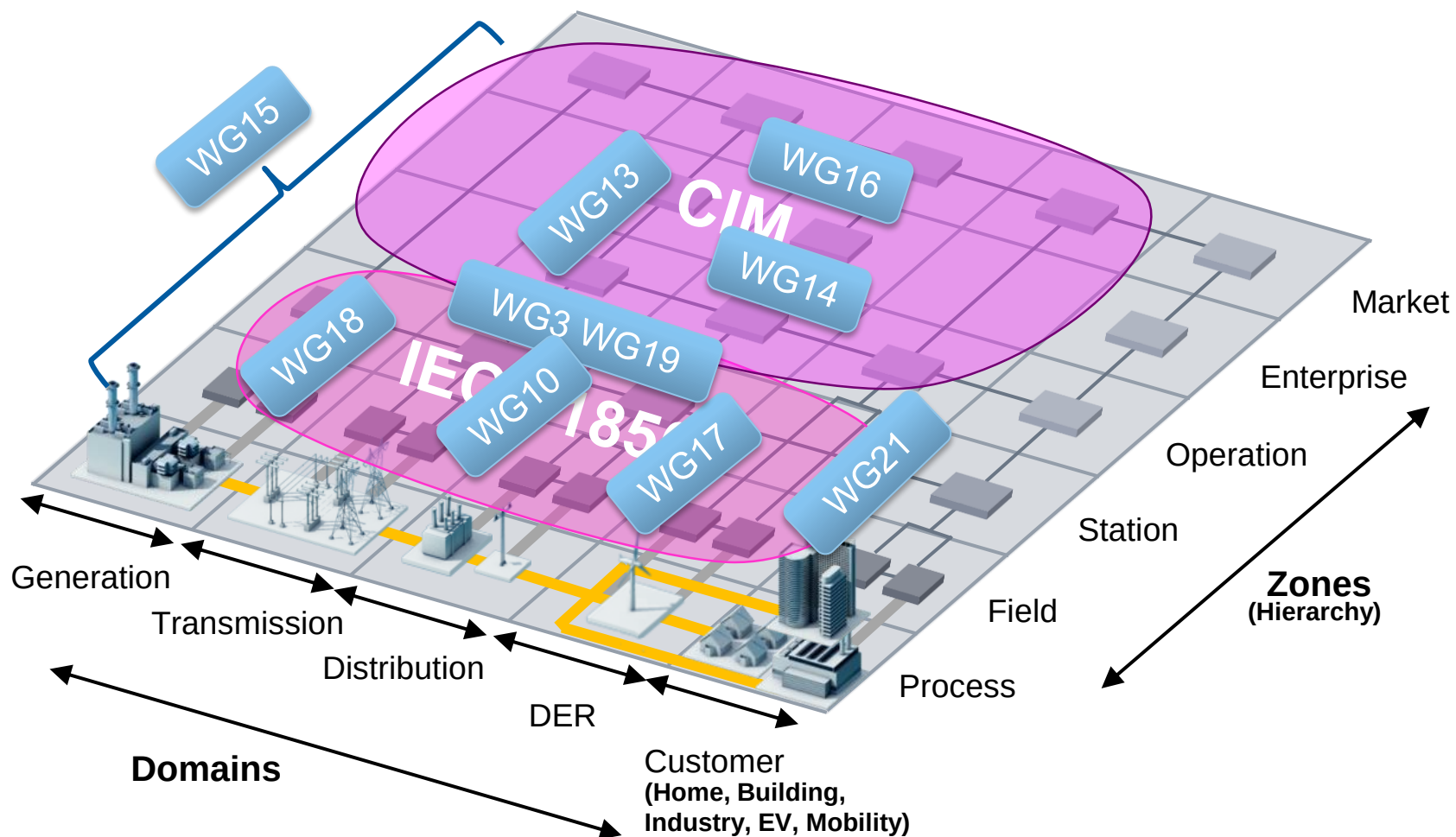


PROZA NET – Informacijska sigurnost

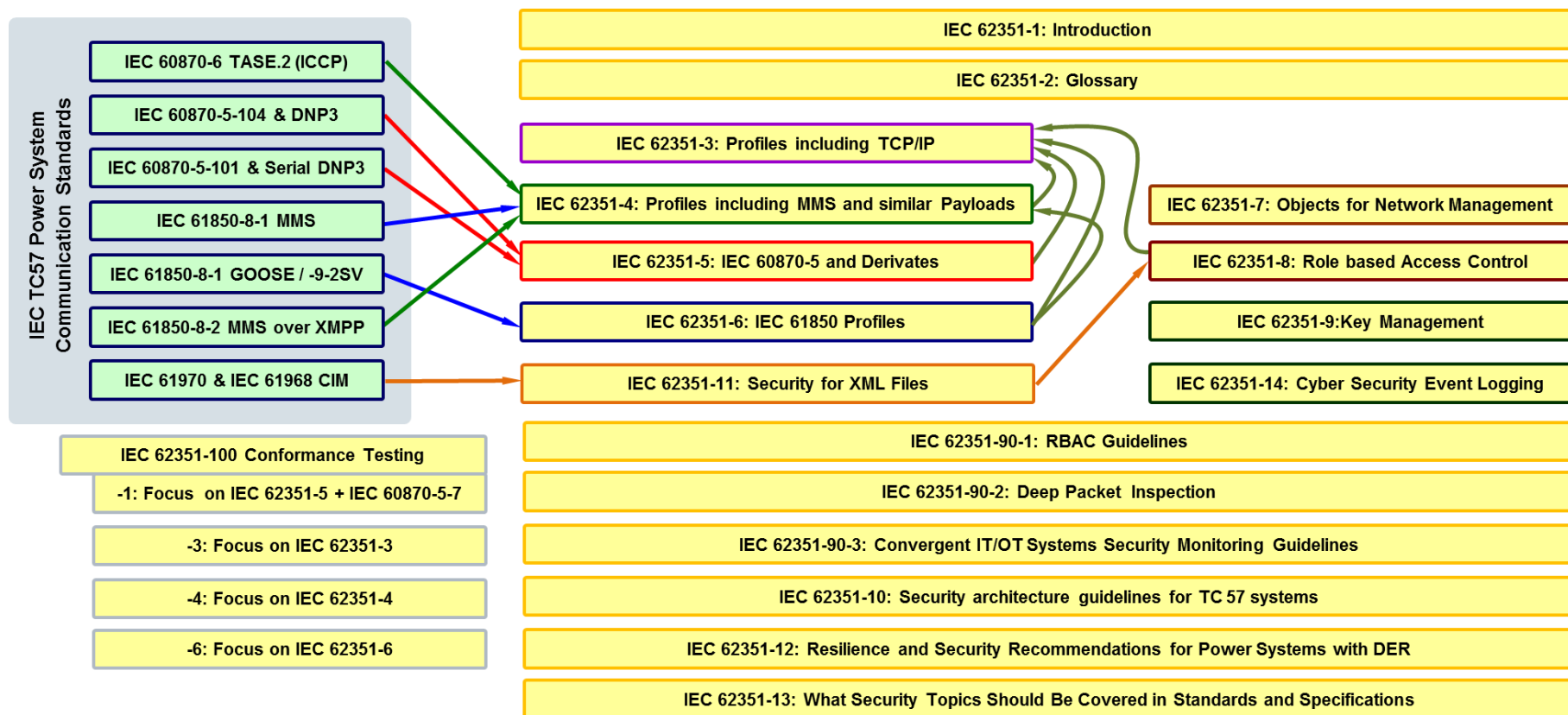
- IEC 62351 & IEC 62443
- Sigurnost SCADA aplikacija
- TSL/SSL/RBAC/SNMP
- H2020 projekti
- ENISA 2014 (CERT)
- CEKOM - SCADA sigurnost



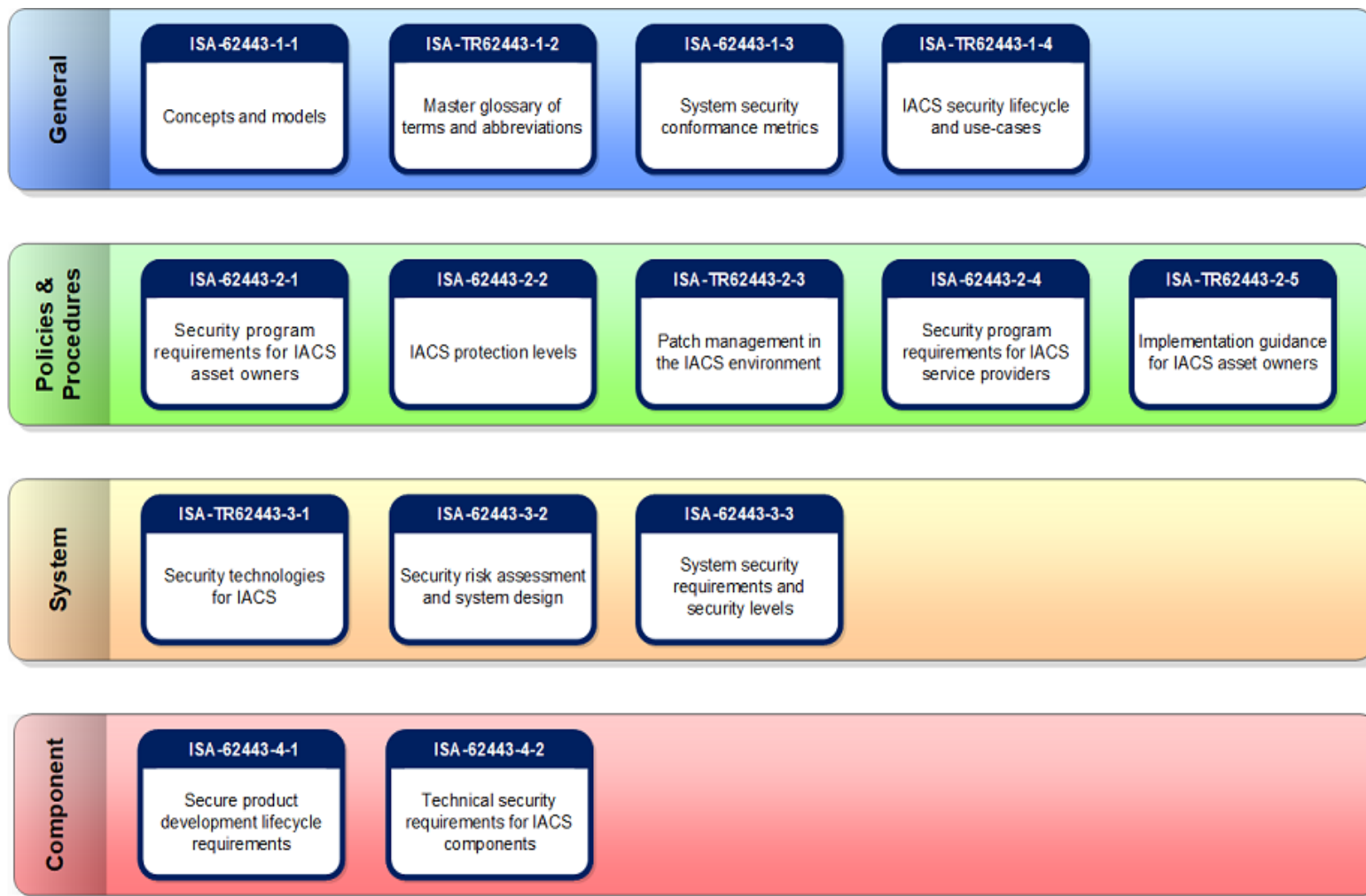
Smart Grid domene - IEC radne grupe



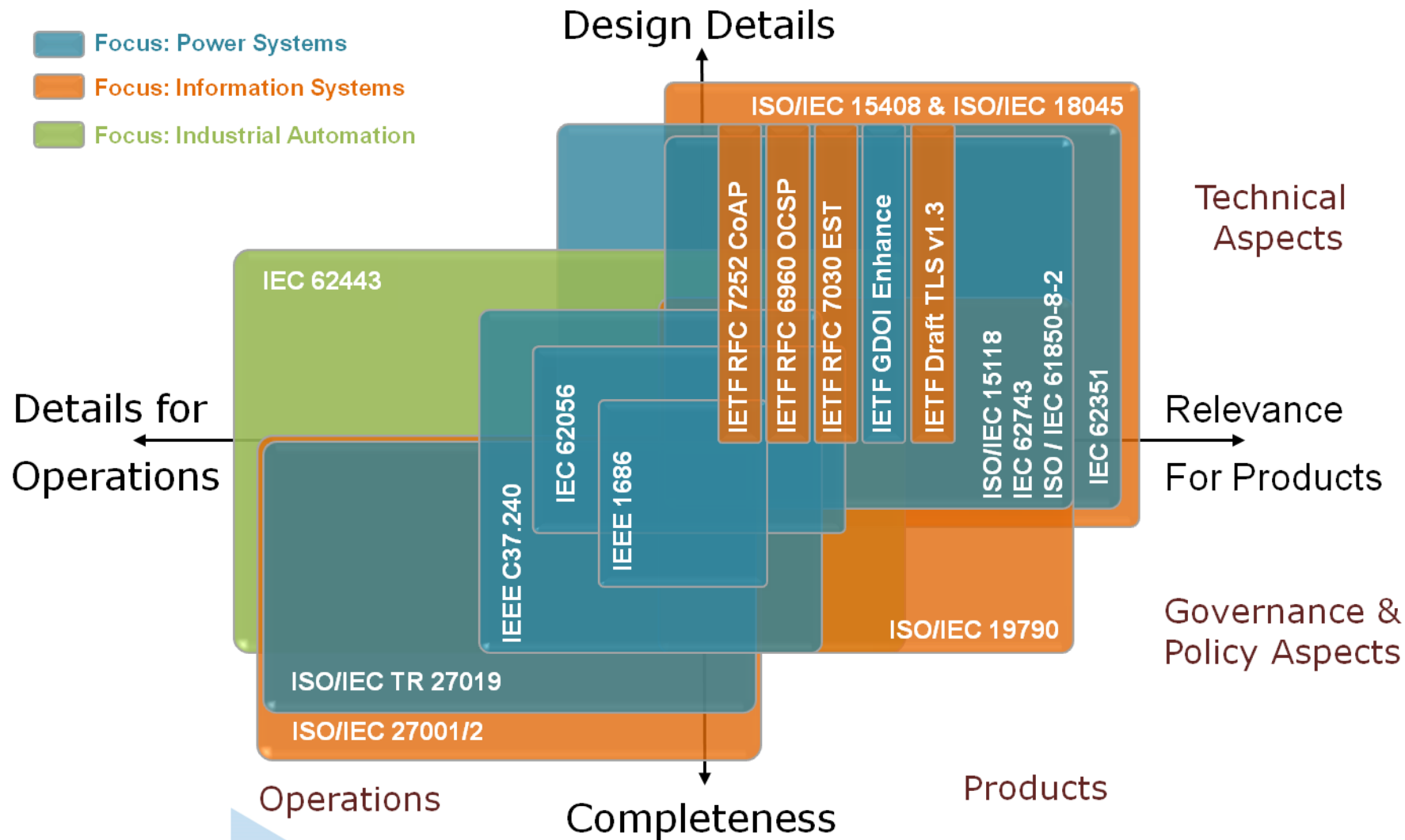
IEC 62351 Kibernetička sigurnost (tehnologija)



IEC 62443 – Kibernetička sigurnost (procesi)

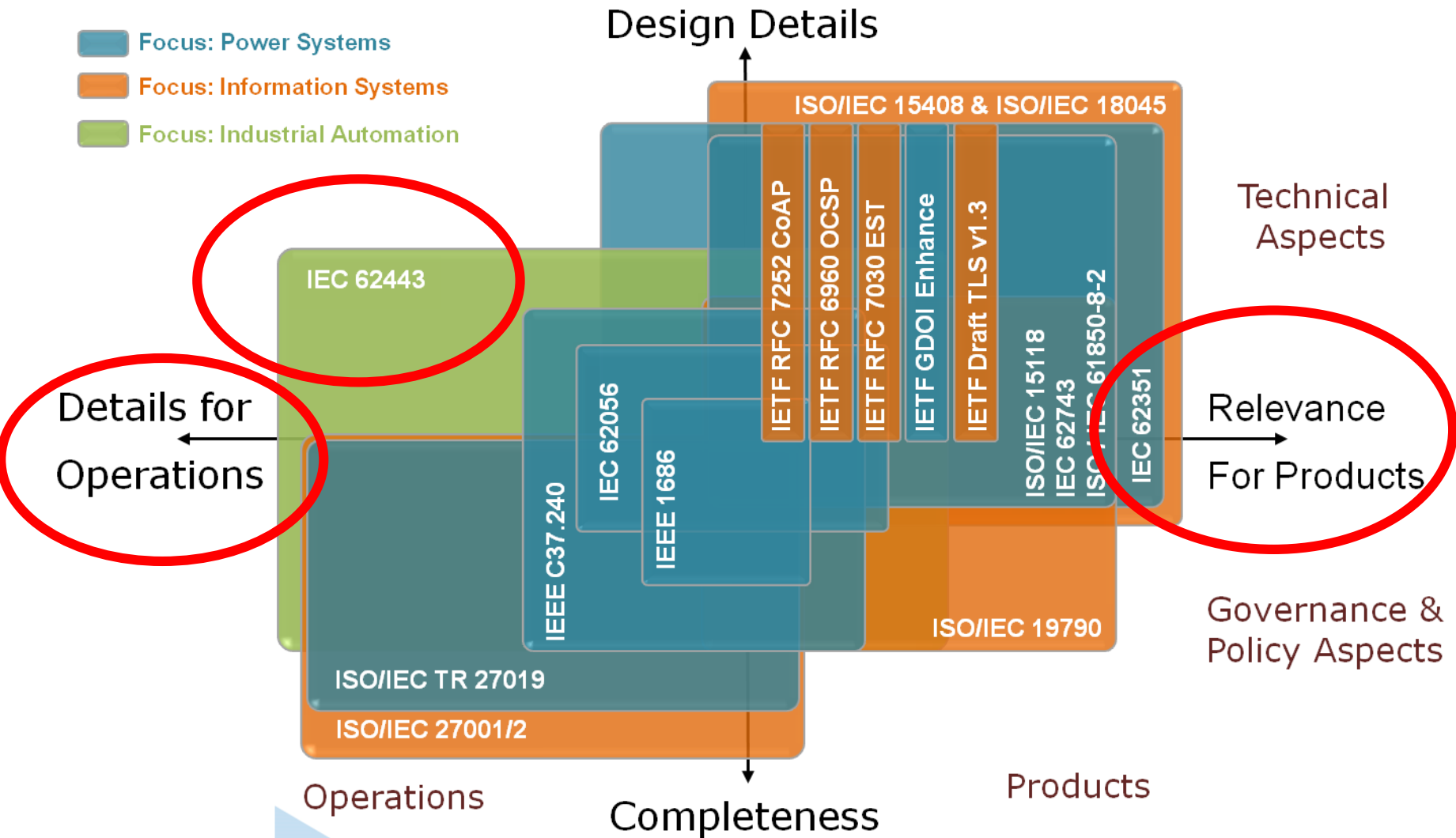


Sigurnosti digitalizirane energetske mreže – presjek standarda*



*Izvor: SEG-CG 2016

Sigurnosti digitalizirane energetske mreže – presjek standarda*



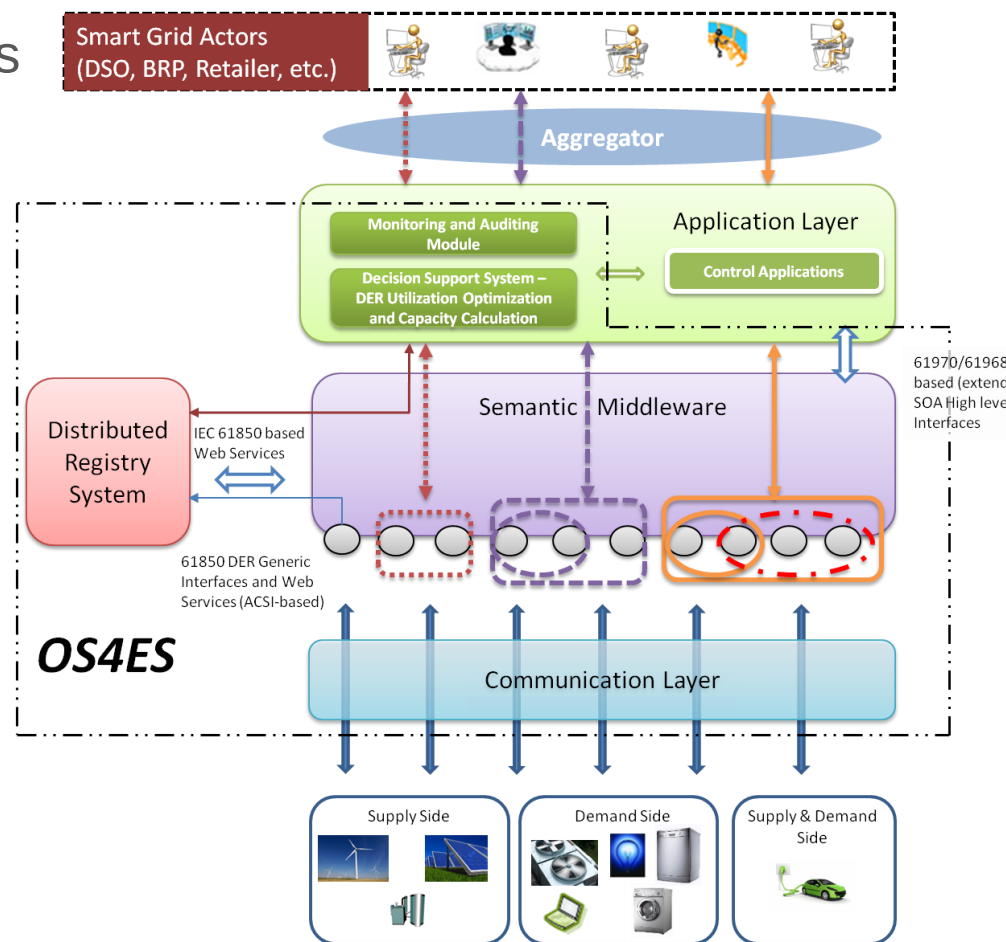
*Izvor: SEG-CG 2016

PROZA NET – OS4ES



- Open System for Energy Services
 - FP7 projekt
 - Trajanje 36 mjeseci (kraj 12/17)
 - 9 partnera iz 6 zemalja
- Budget: 4.22M €
- Grant projekta: 2.86M €

OS4ES



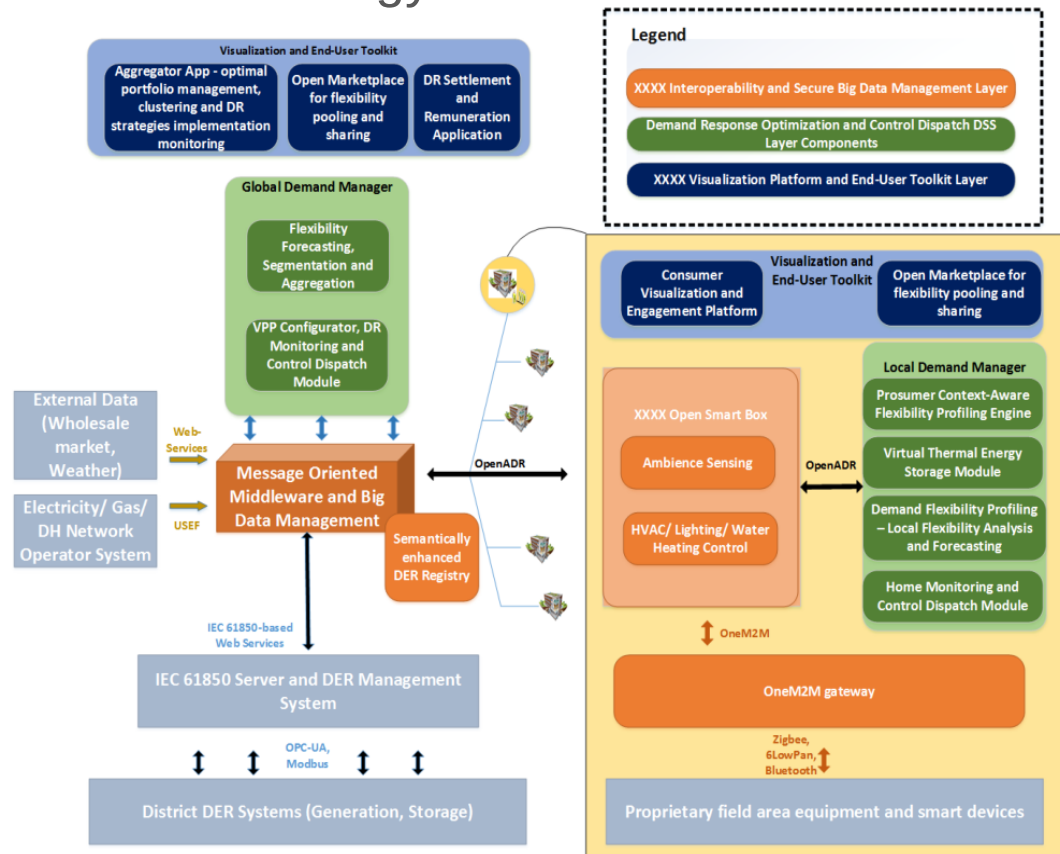
KONČAR

FLEXCOOP

- Democratising the energy market through introduction of innovative demand response tools and novel business models for energy cooperatives
 - H2020 proejkt
 - 36 mjeseci (start 11/17)
 - 13 partnera iz 8 zemalja
- Budget 3.97M €
- Grant : 3.97M €



FLEXCoop

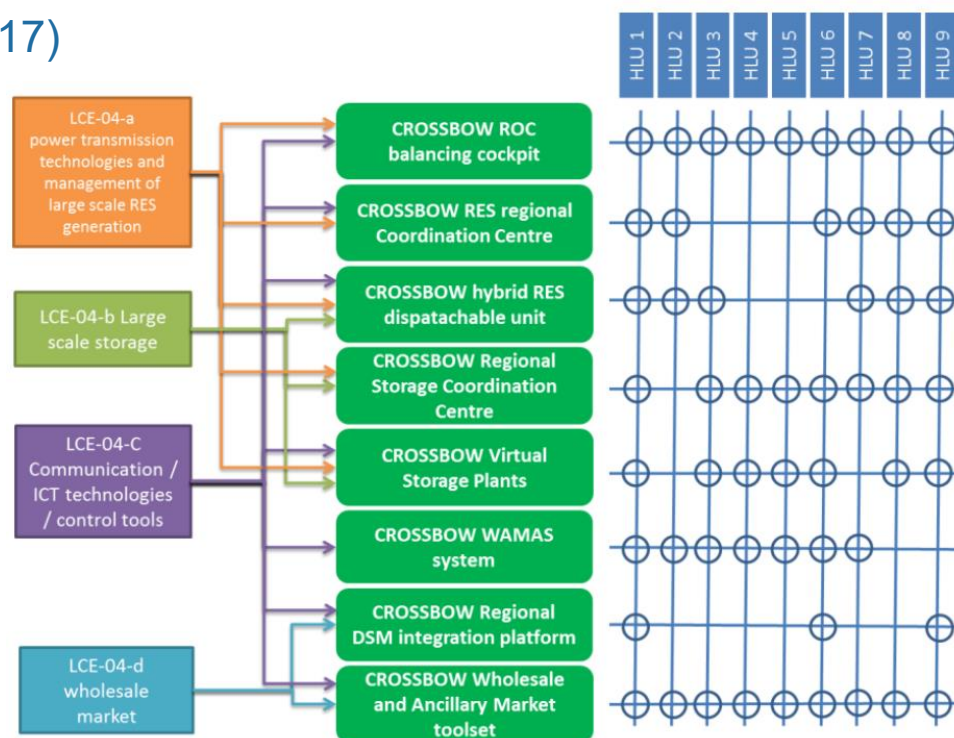


KONČAR

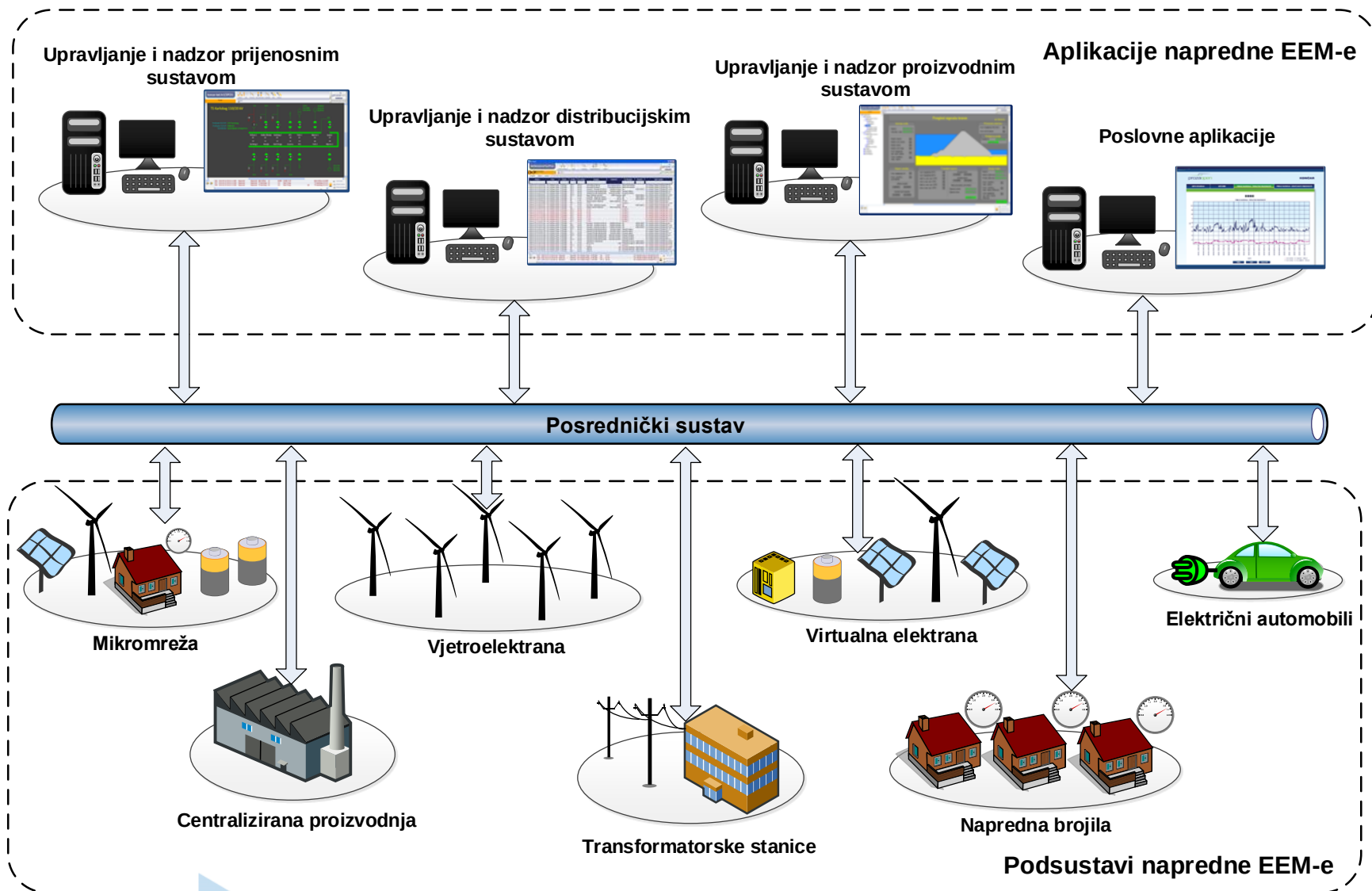
CROSSBOW



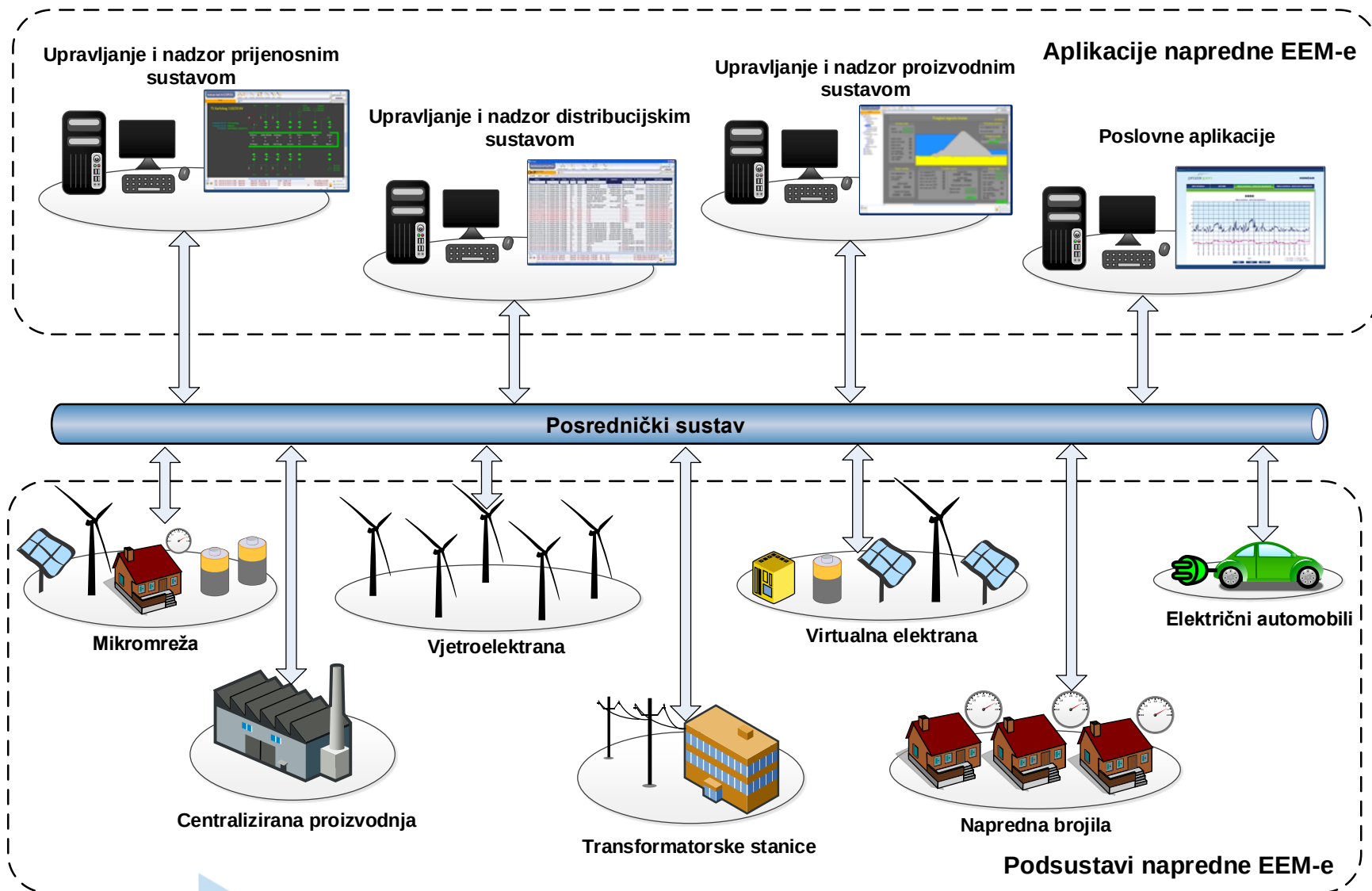
- CROSS BOrder management of variable renewable energies and storage units enabling a transnational Wholesale market
 - H2020 projekt
 - Trajanje 48 mjeseci (početak 11/17)
 - 23 partnera iz 13 zemalja
- Budget
- Vrijednost projekta: 22.09M €
- Grant projekta: 17.29M €



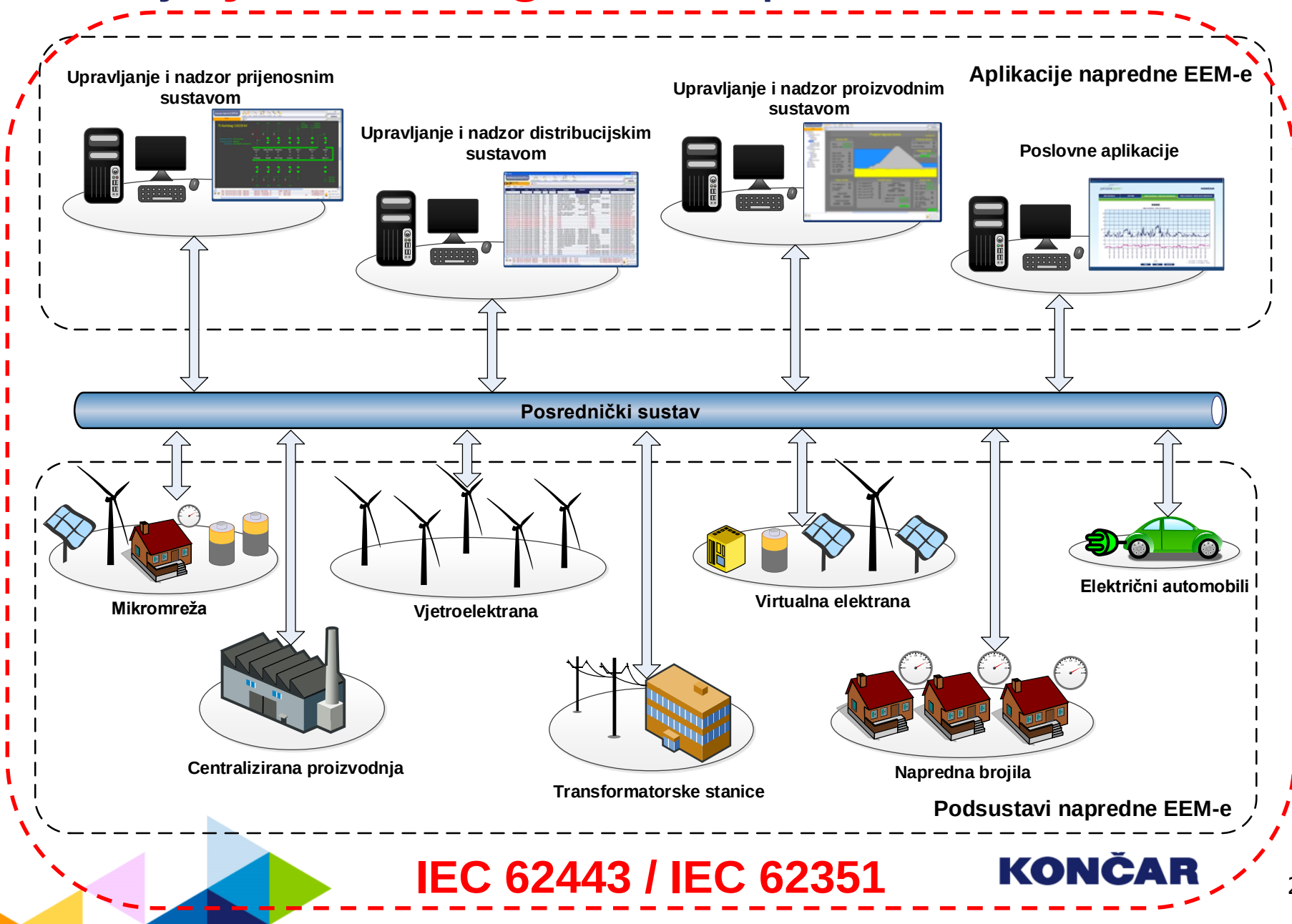
Razvoj napredne EEM-e



Razvoj **sigurne** napredne EEM-e?



Razvoj cjelovito sigurne napredne EEM-e!



IEC 62443 / IEC 62351

KONČAR

KONČAR



KONČAR