Modul i profil Elektroenergetika

Tomislav Capuder

Zavod za visoki napon i energetiku

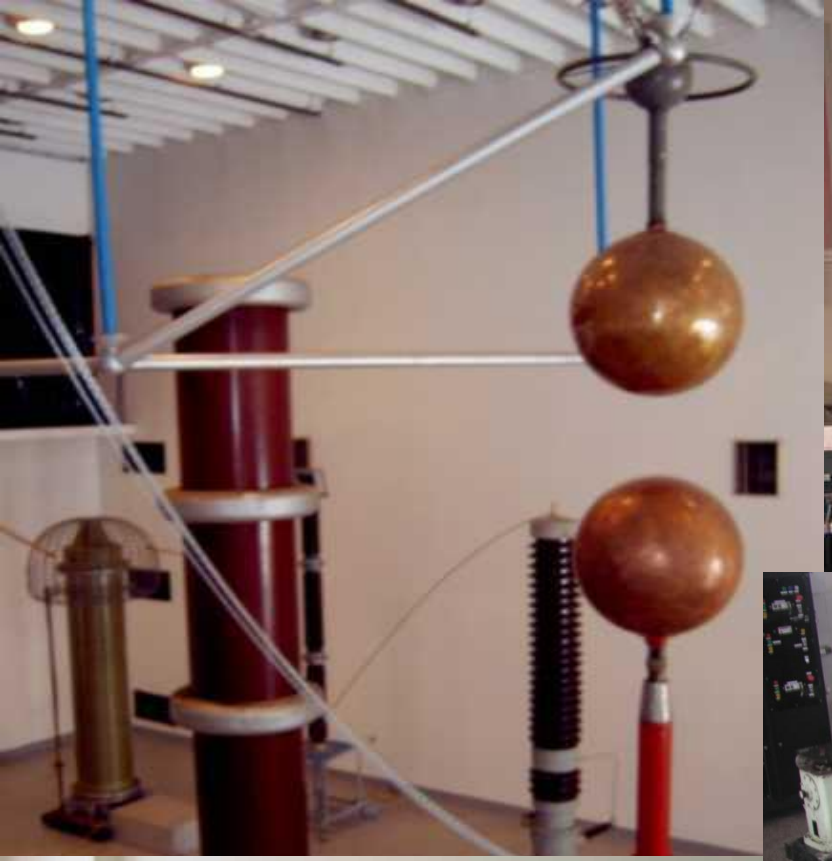
Što je energetika?

- Biznis vrijedan 7 trilijuna dolara -> najvrjedniji tržišni segment na svijetu
- Samo na dostavu korisnih oblika energije građanima otpada 10% svjetskog BDP-a
- Energetika kreira veće prihode od bilo kojeg drugog sektora
- EU financira projekte iz energetike s 33 milijardi eura od 2014 do 2020

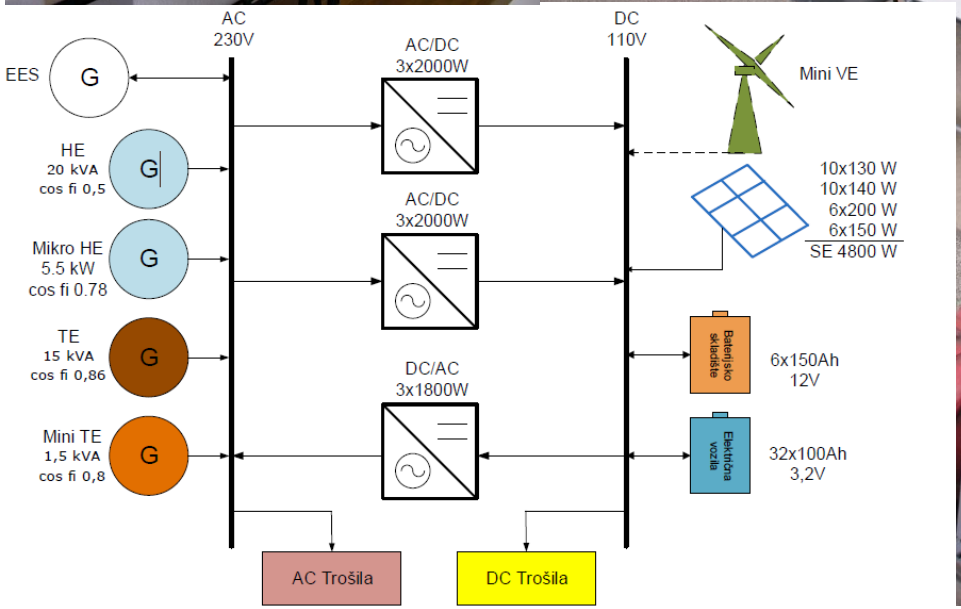
5 istraživačkih laboratorija

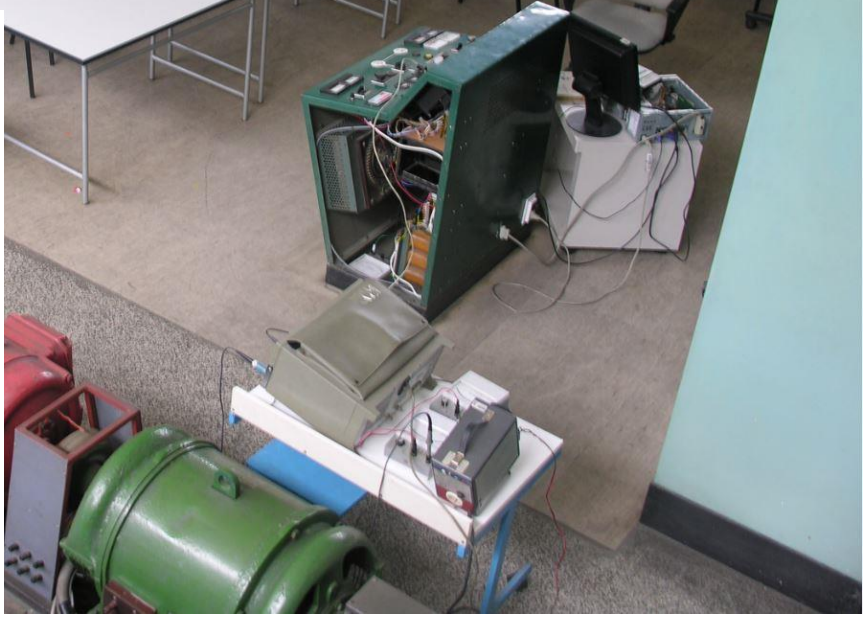
- **Smart Grid Lab (SGLab)**
- **Laboratory for Energy and Environmental Markets and Exchanges (LEEMaE)**
- **Power System Protection Lab (PSP Lab)**
- **Atmospheric Phenomena Laboratory (APPLY)**
- **Laboratory for Nuclear Energy and Safety (LNES)**

ŠTO TO ZNAČI?
ŠTO ĆU RADITI NA ZVNE?



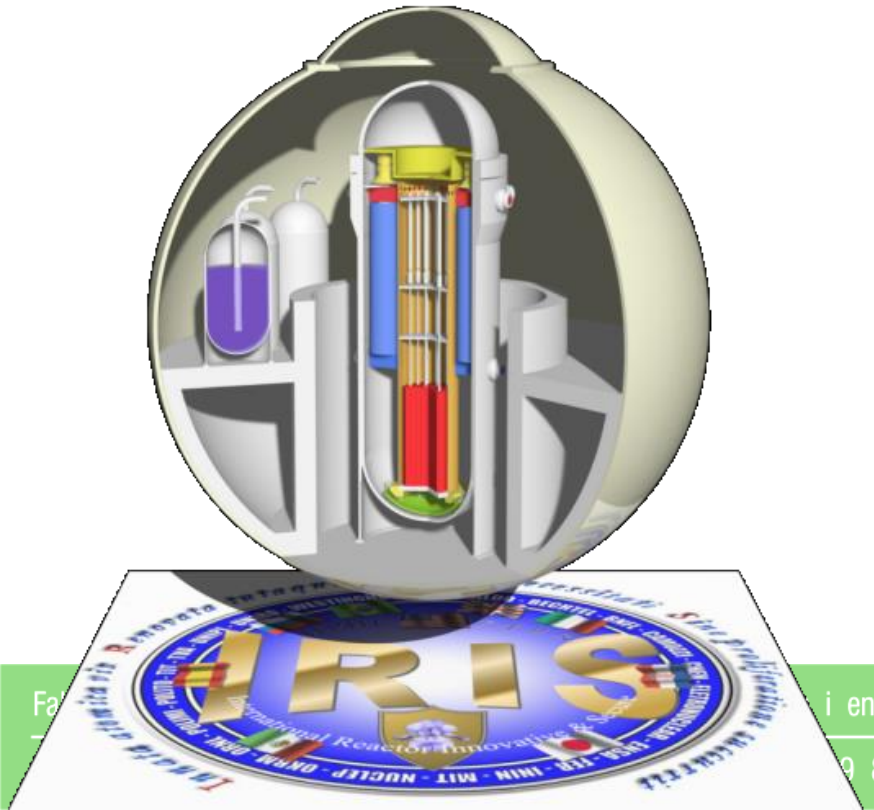
SG i PSP lab

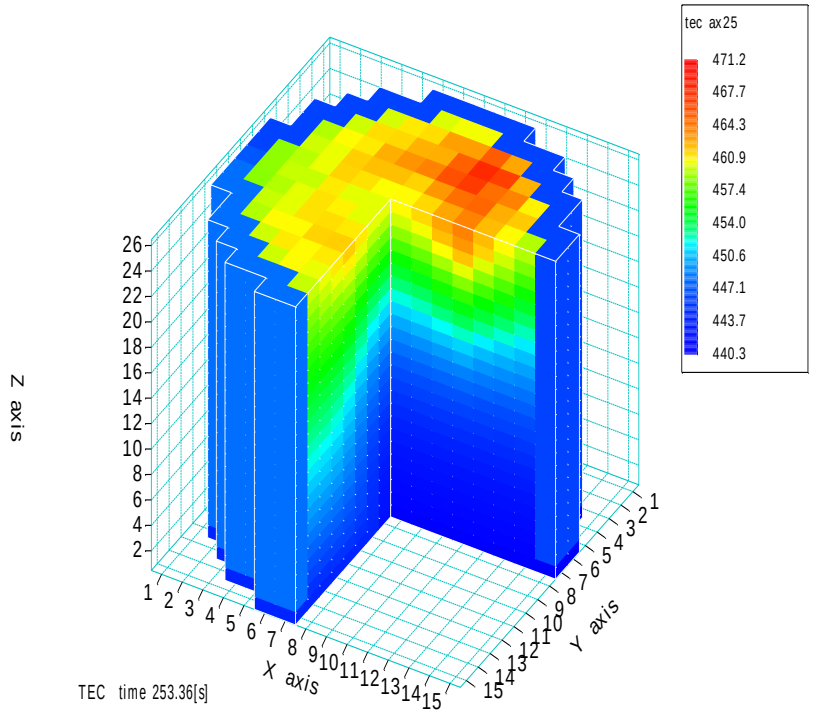

AC
230V
DC
110V
EES
G
AC/DC
3x2000W
Mini VE
HE
20 kVA
cos fi 0,5
10x130 W
10x140 W
6x200 W
6x150 W
SE 4800 W
Mikro HE
5.5 kW
cos fi 0.78
TE
15 kVA
cos fi 0,86
Baterijsko skladište
6x150Ah
12V
DC/AC
3x1800W
Mini TE
1,5 kVA
cos fi 0,8
Električna vozila
32x100Ah
3,2V
AC Trošila
DC Trošila



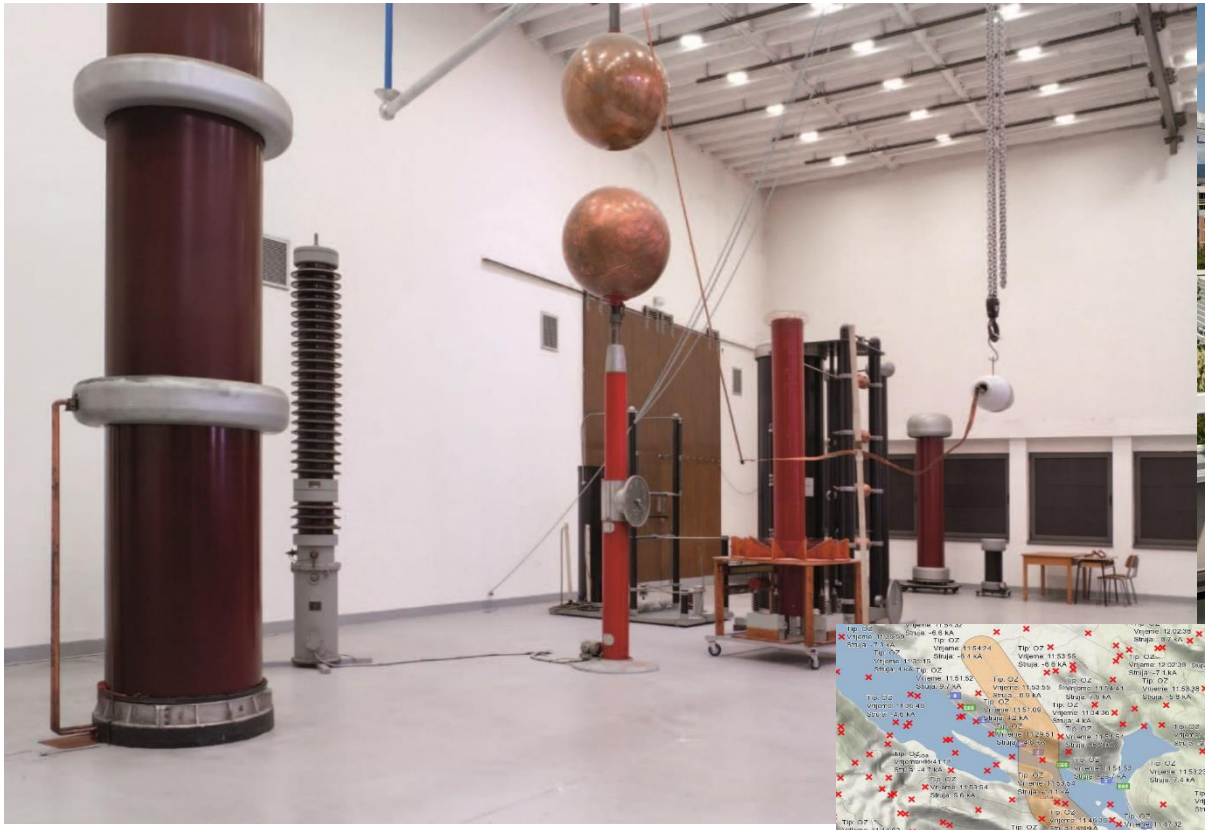
LNES lab

- Nuklearna elektranu Krško
- IRES – modularne, fleksibilne nuklearne elektrane
- IV. Generacija





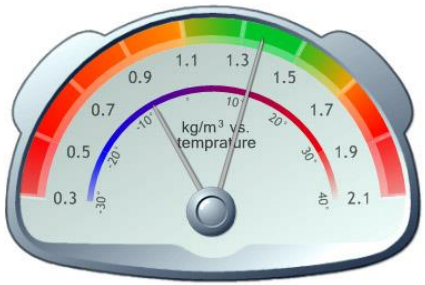
APPLY Lab



LIONHEART
monacoyle.com

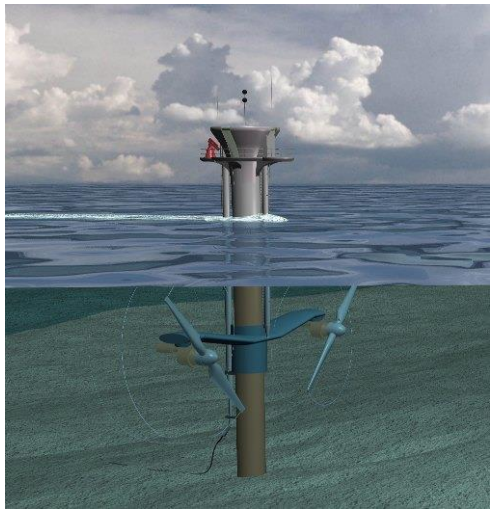
STORAGE TANKS
CLEAN OIL TANK 6
FUEL DAY TANK 1
FUEL TANK 8
FUEL TANK 10
FRESH WATER TANK 13
FUEL TANK 16
FUEL DAY TANK 2
FUEL TANK 9
FUEL TANK 11
FRESH WATER TANK 14
11000 lit
BACK

VARIOUS ALARMS 2
MAIN SEA CHEST
BATTERY BLOWER
ENG. ROOM PRESS.
ENG. ROOM TEMP.
UPS UNIT
ANCHOR ENGINE
HYDRAULIC OIL
STEERING OIL
KITCHEN VENTILATION
RESIDENCE VENTILATION
BACK


kg/m3 vs. tempratture
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1

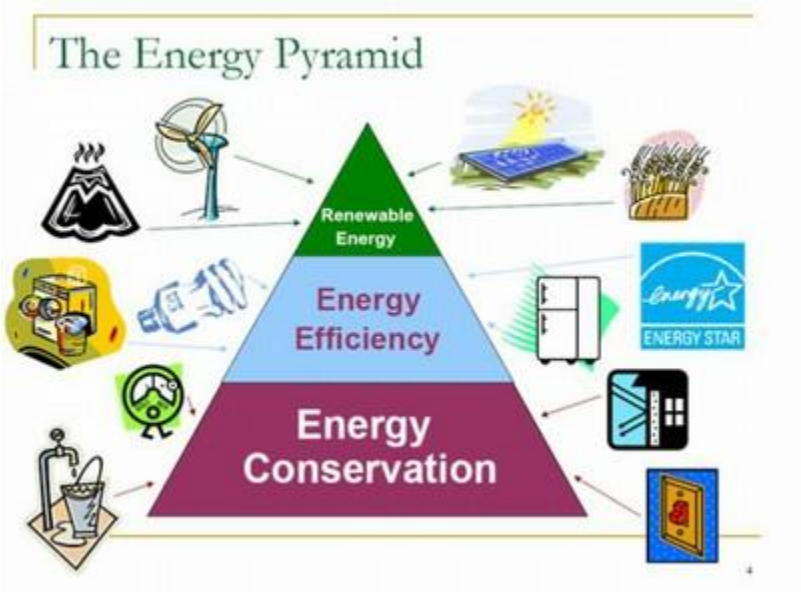
Proizvodnja, prijenos, distribucija, potrošnja

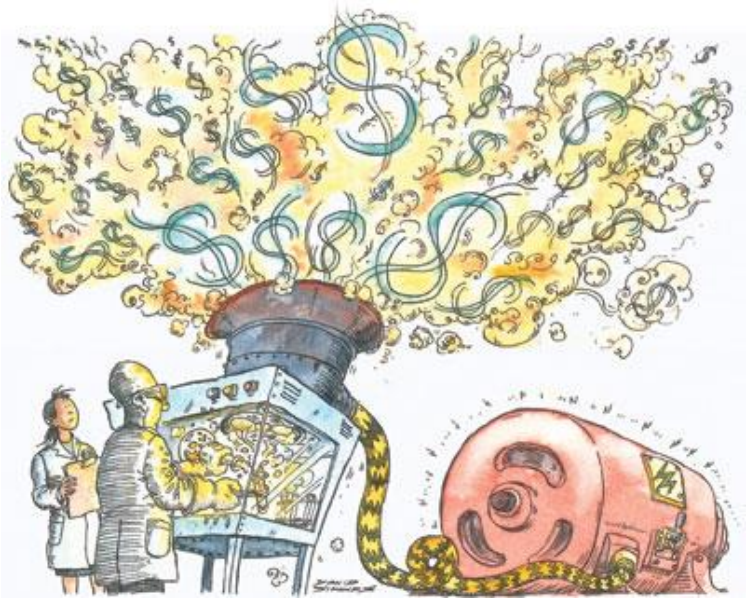
Novi izvori energije



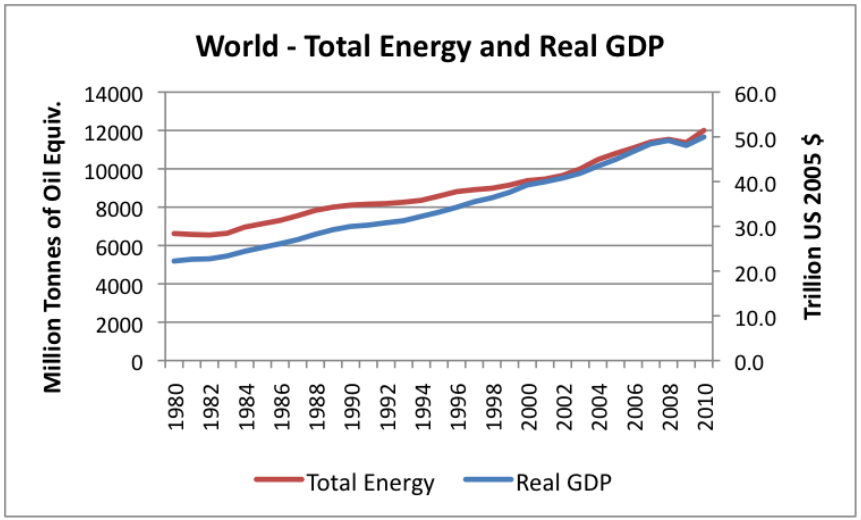
Nove tehnologije

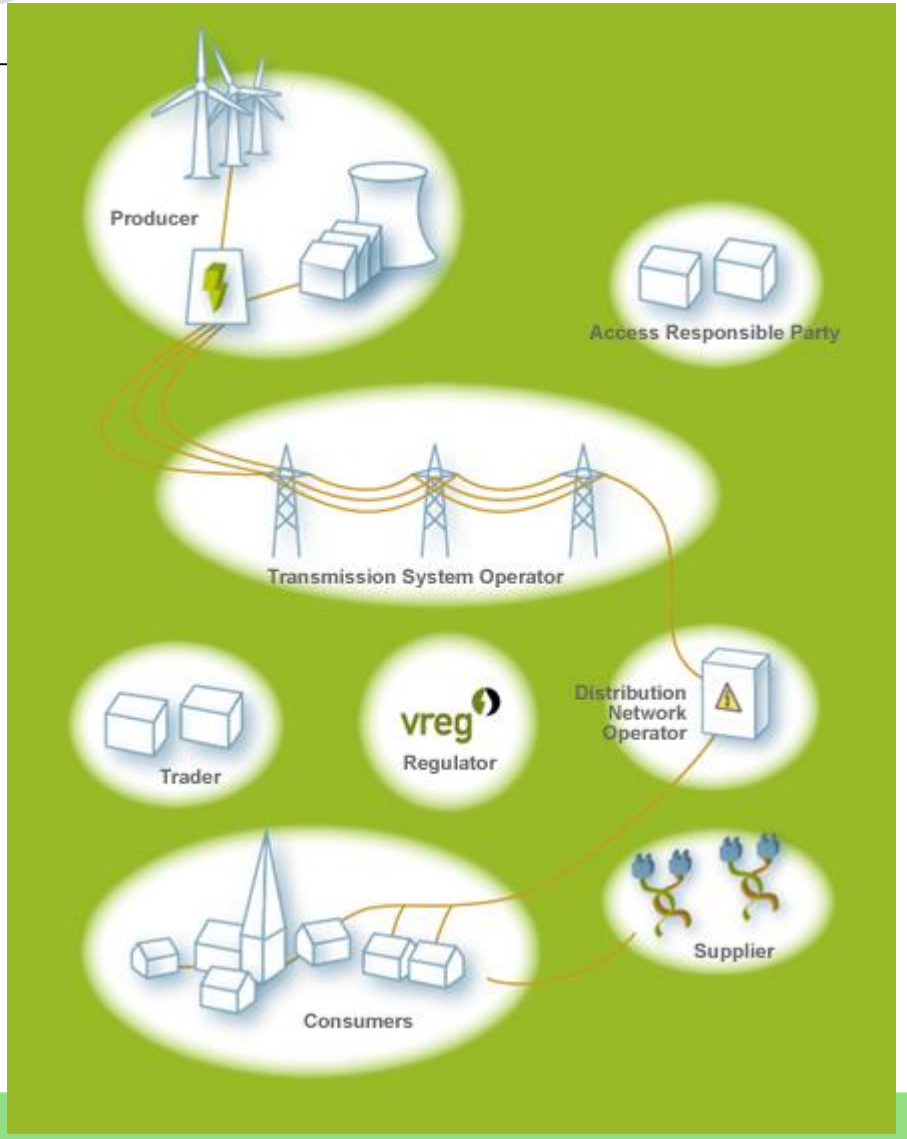
Energetska učinkovitost i zaštita okoliša



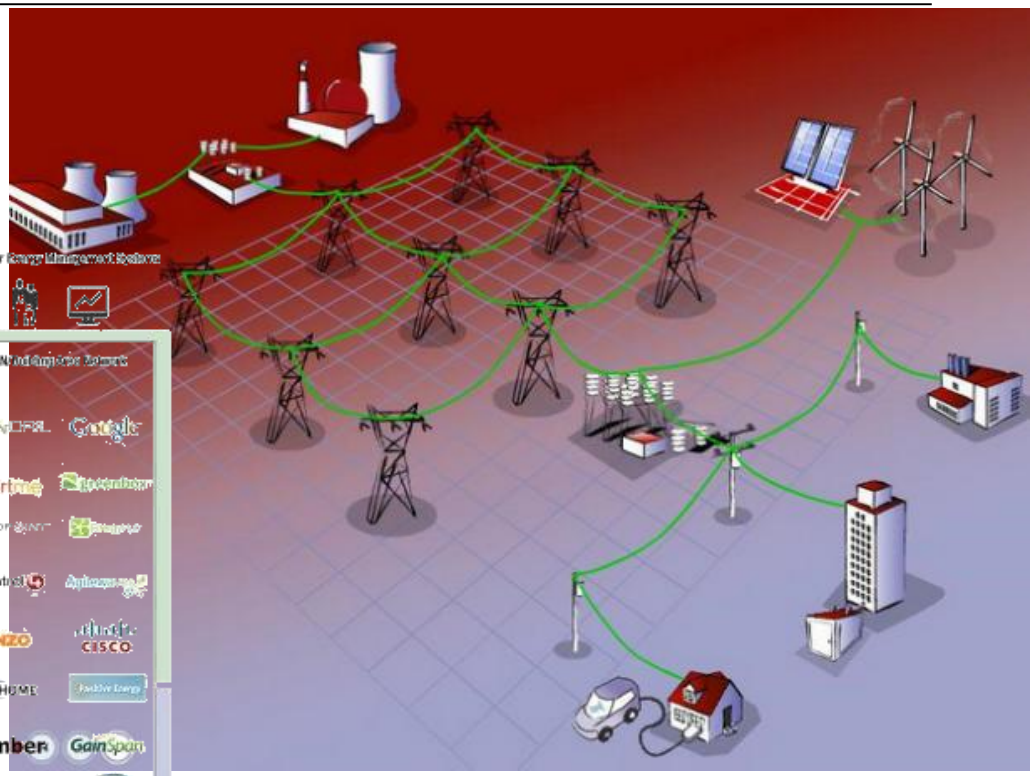


Ekonomija u energetici





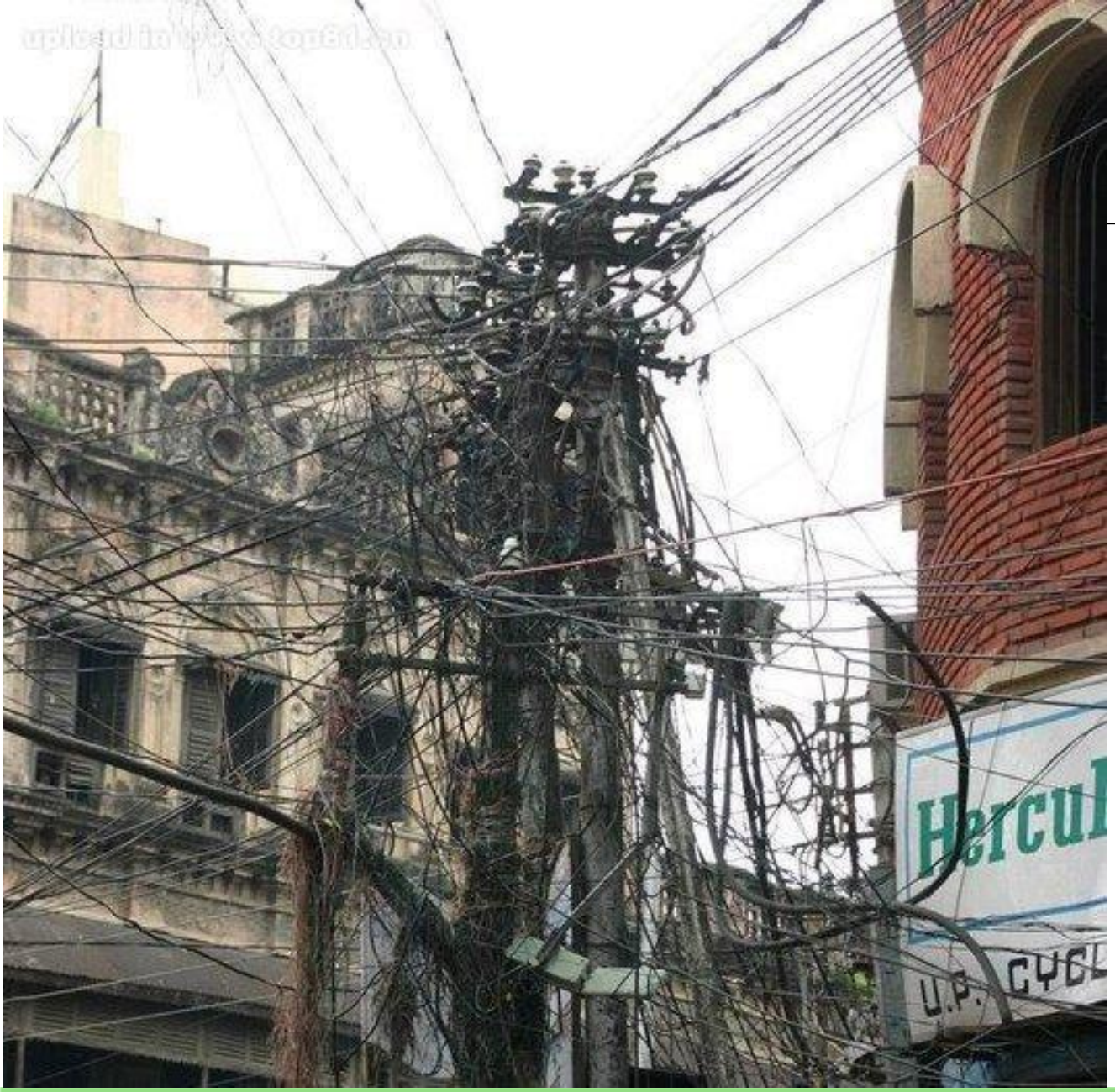
Tehnički sustavi EES-a



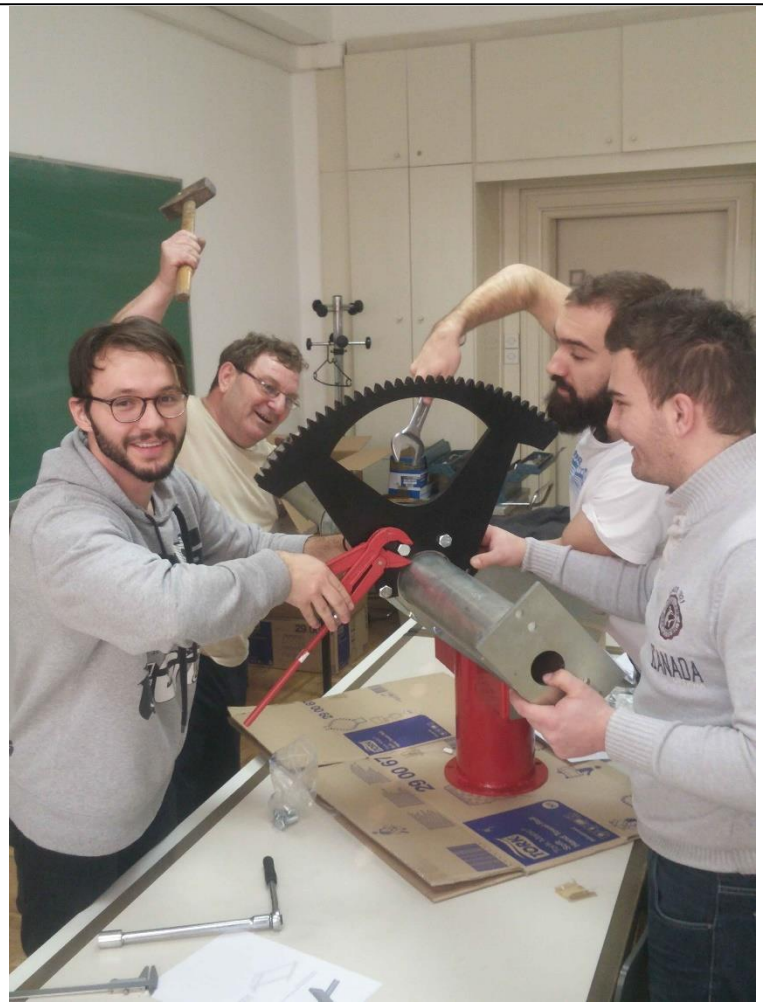
"End-to-End" Smart Grid
Leading Players by Market Segment

Future Apps and Services
Smart Charging and V2G
Distributed Generation and Storage
Grid Optimization
Demand Response
AMI
Communications Layer
Power Layer

Players to be determined over time for future applications and services
GRIDPOINT
better place
GRIDPOINT
IBM
TELVENT
ABB
SIEMENS
current
SEL
comverge
ENERNOC
GRIDPOINT
cpower
Meter Data Management
Smart Meter Manufacturers
Itron
SENSUS
elster
ECHELON
LAN
WAN
FAN/AMI
ember
GainSpan
Microsoft
intel
Network Gateway
Smart Meter
Generation
Transmission
Substation
Distribution
Home/Building
Distributed Generation and Storage
Utility
Infrastructure
Consumer


Hercul
U.P. CYCL

Kako izgleda studiranje na ZVNE



Što nakon studija energetike?

- Imate znanja:
  - Tehnička
  - Pravna
  - Ekonomska
  - Upravljačka

Radite za sebe ne za druge!!!!

- Tko će vas zaposliti?
  - HEP, HOPS, Končar, CRODUX, INA, Plinacro, HROTE, HERA, RWE….
  - Siemens, Schneider, ABB, ORACLE, EXOR
  - Banke, Fondovi, konzultanti (E&Y, Delloitte)
  - Agrokor, HT, FINA, Ericsson, hoteli, zračne luke, gradovi, općine, razvojne agencije

4m

Pridružite nam se!

Zavod za visoki napon i energetiku
D zgrada, 2. kat

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