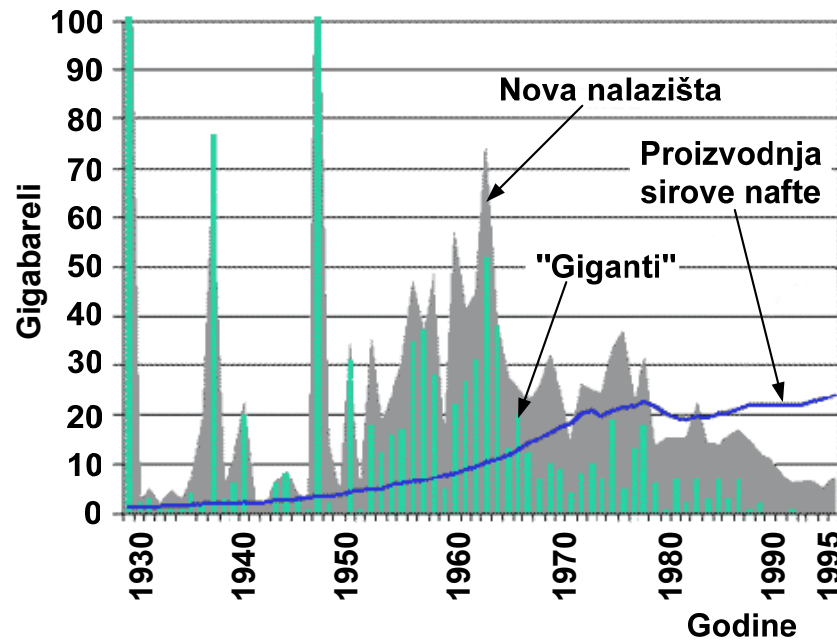


Instalacijski sustavi u održivoj gradnji

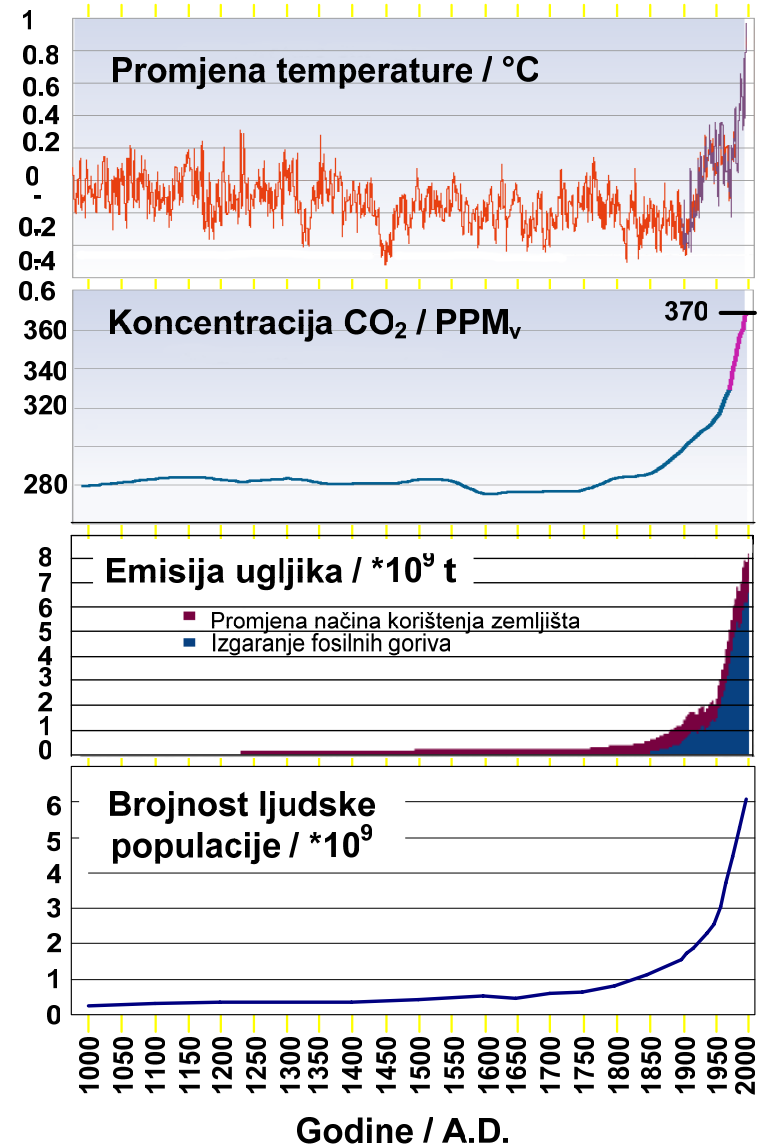
Ninoslav Kurtalj dipl.ing



Nafta, ljudi, emisija Globalno zatopljenje



Izvor : Ludwig Bolkow-System Technology Ltd.



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Stvarnost - Argentina, Patagonia



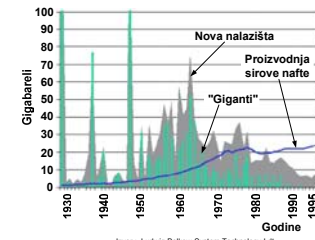
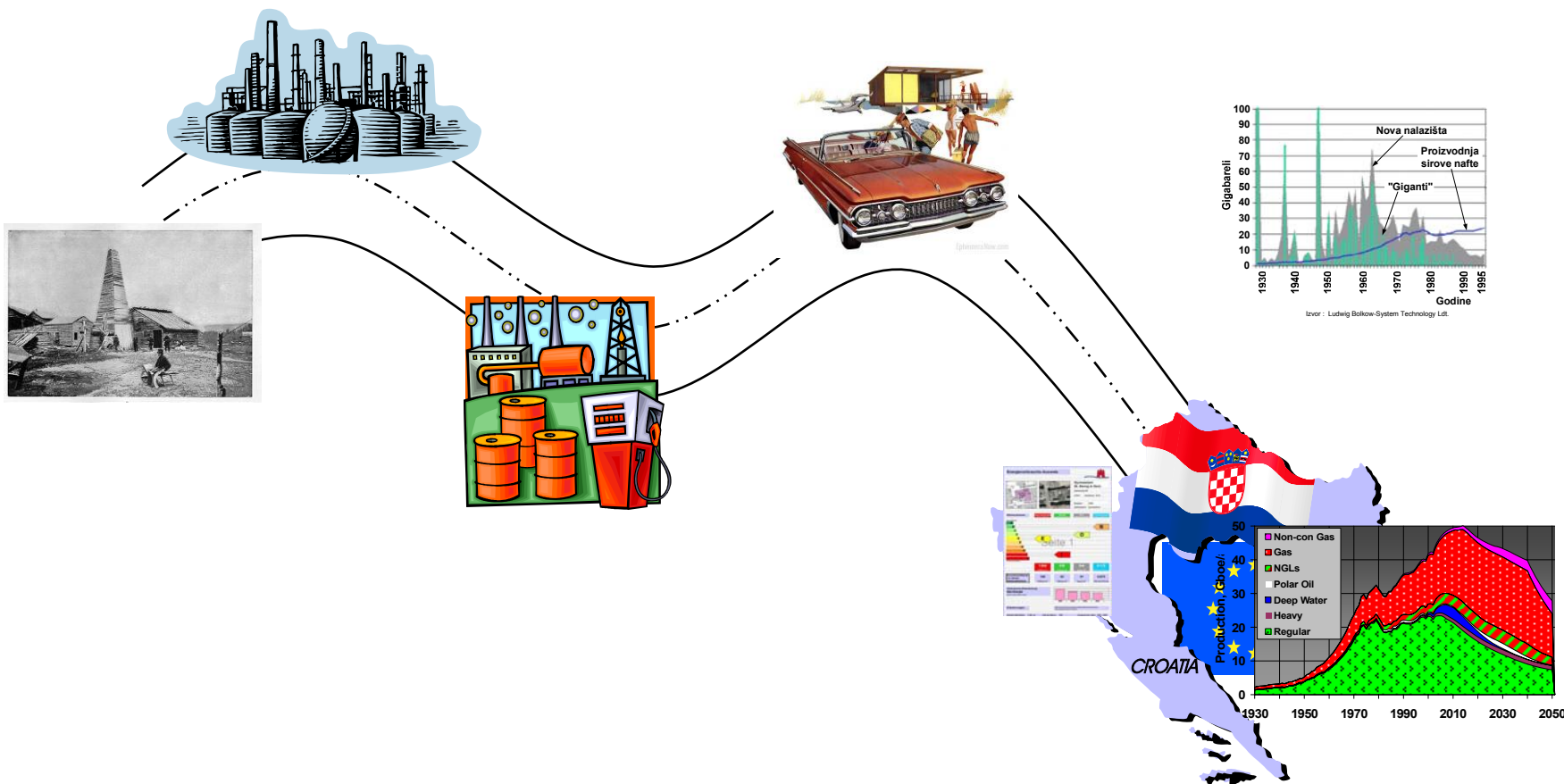
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Perspektiva



The Directive 2002/91/EC (EPBD)

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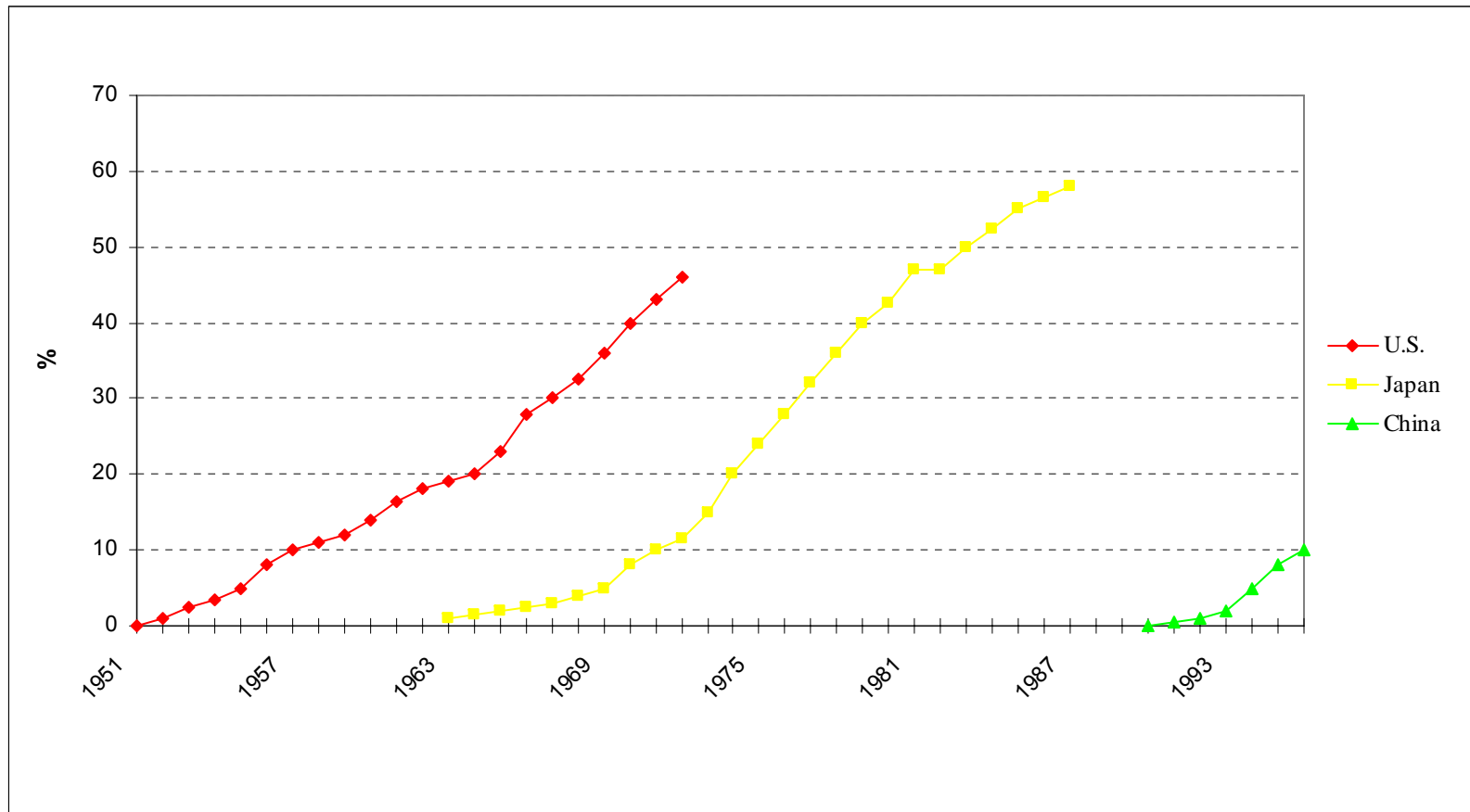
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Popularizacija Klima uređaja u Kini Japanu, i U.S.



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Source: Center for Building Performance and Diagnostics, a NSF/IUCRC, and ABSIC at Carnegie Mellon



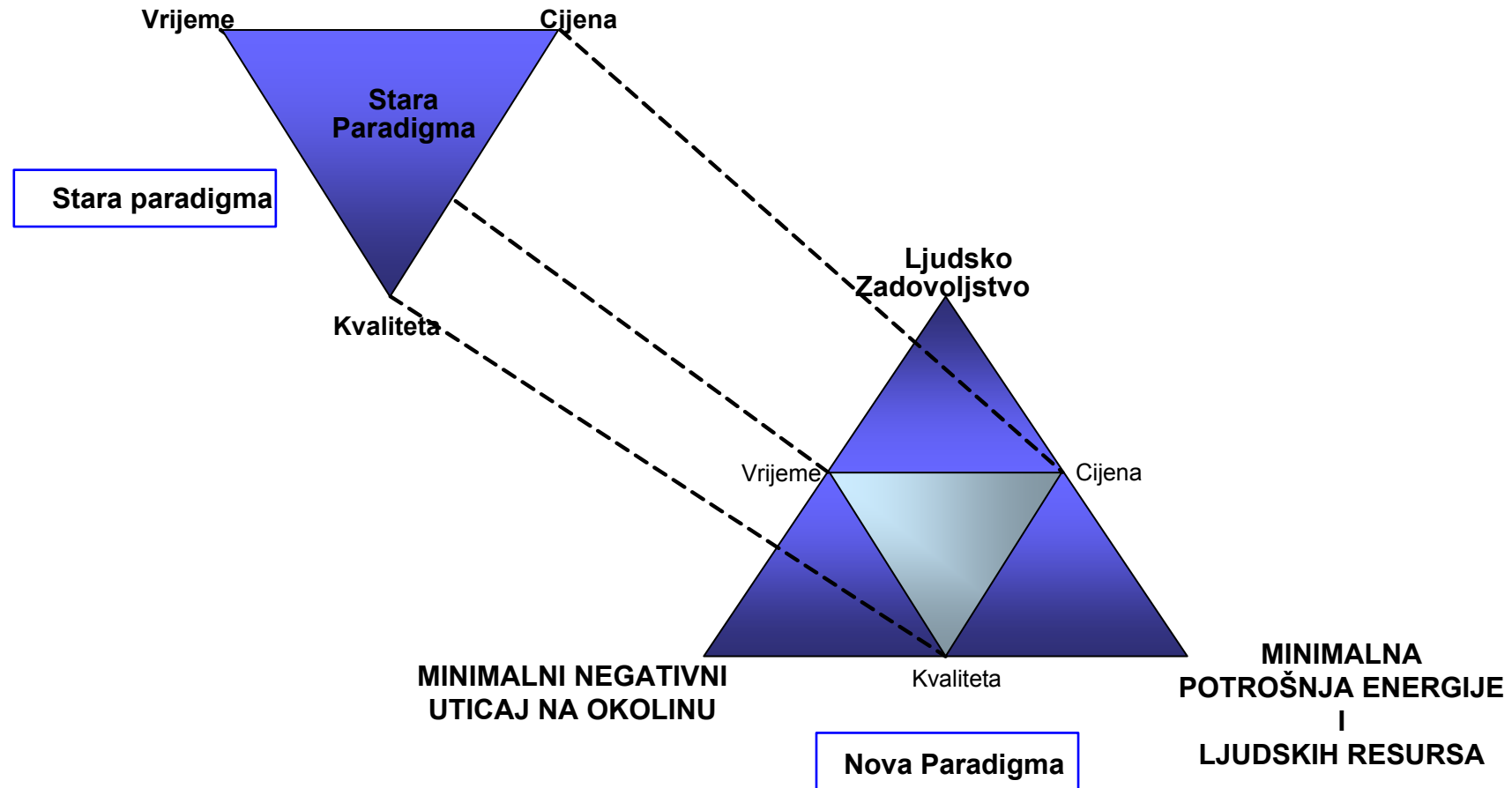
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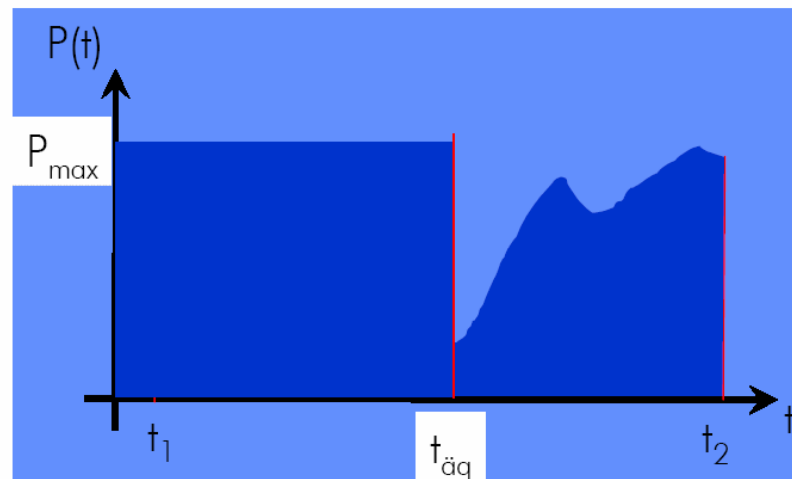
Pomak paradigme prema održivoj izgradnji



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Sustavi u zgradi Energy demand for lighting

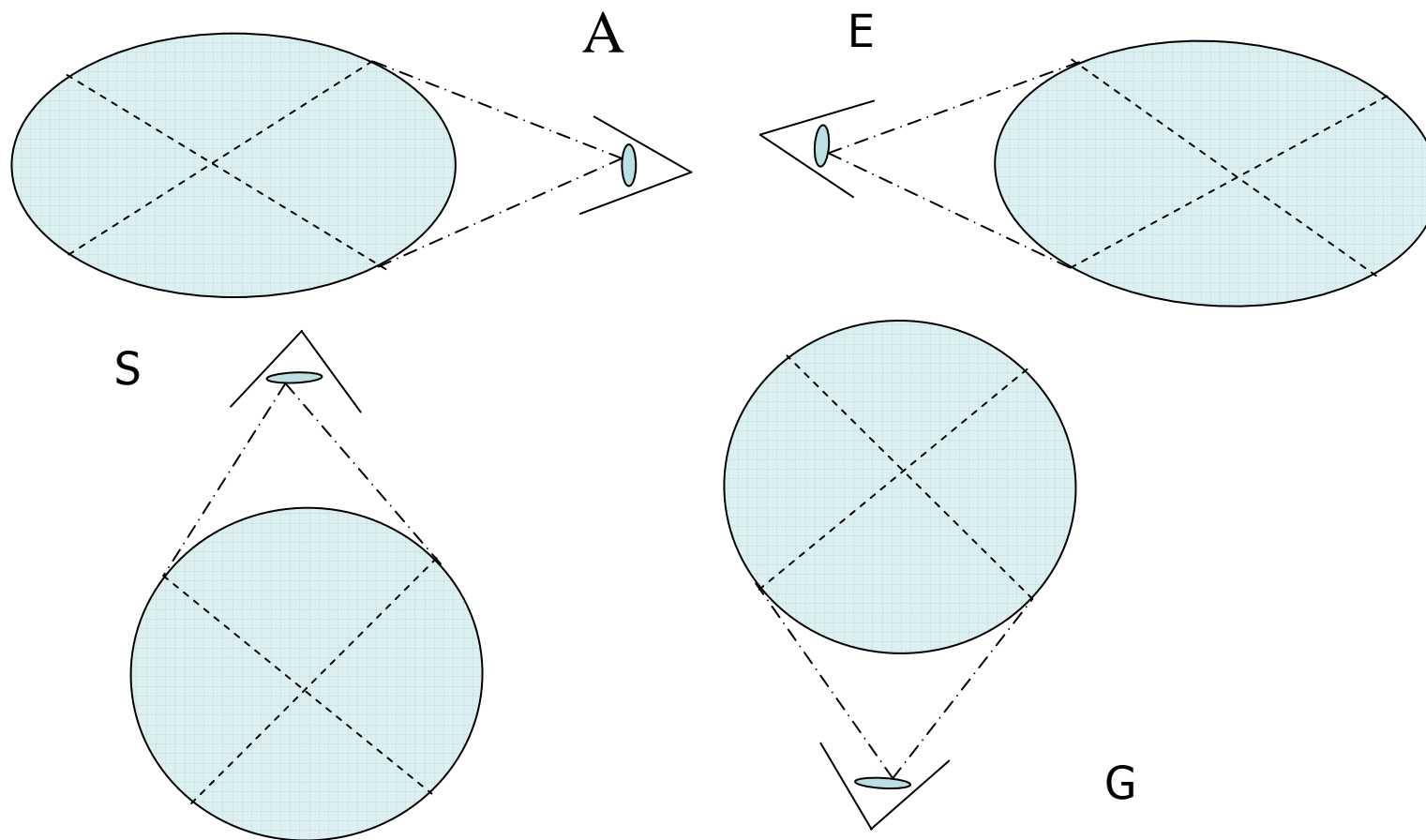
$$Q = \int_{t_{\text{Anfang}}}^{t_{\text{Ende}}} P(t) dt$$



$$Q = P_{\text{max}} \cdot t_{\text{äq}}$$

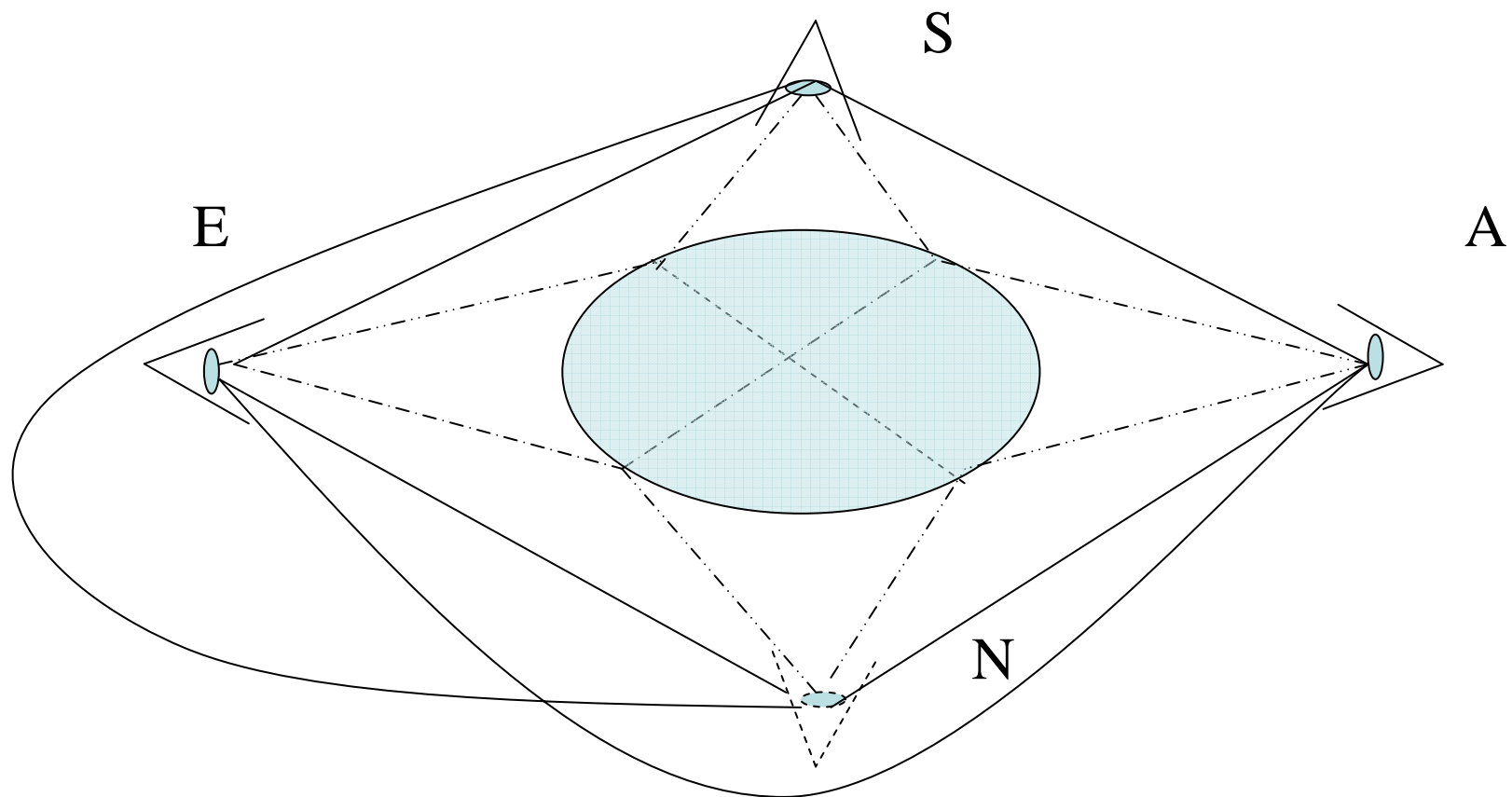
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Pojedinačni rad više projektanata



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Timski rad



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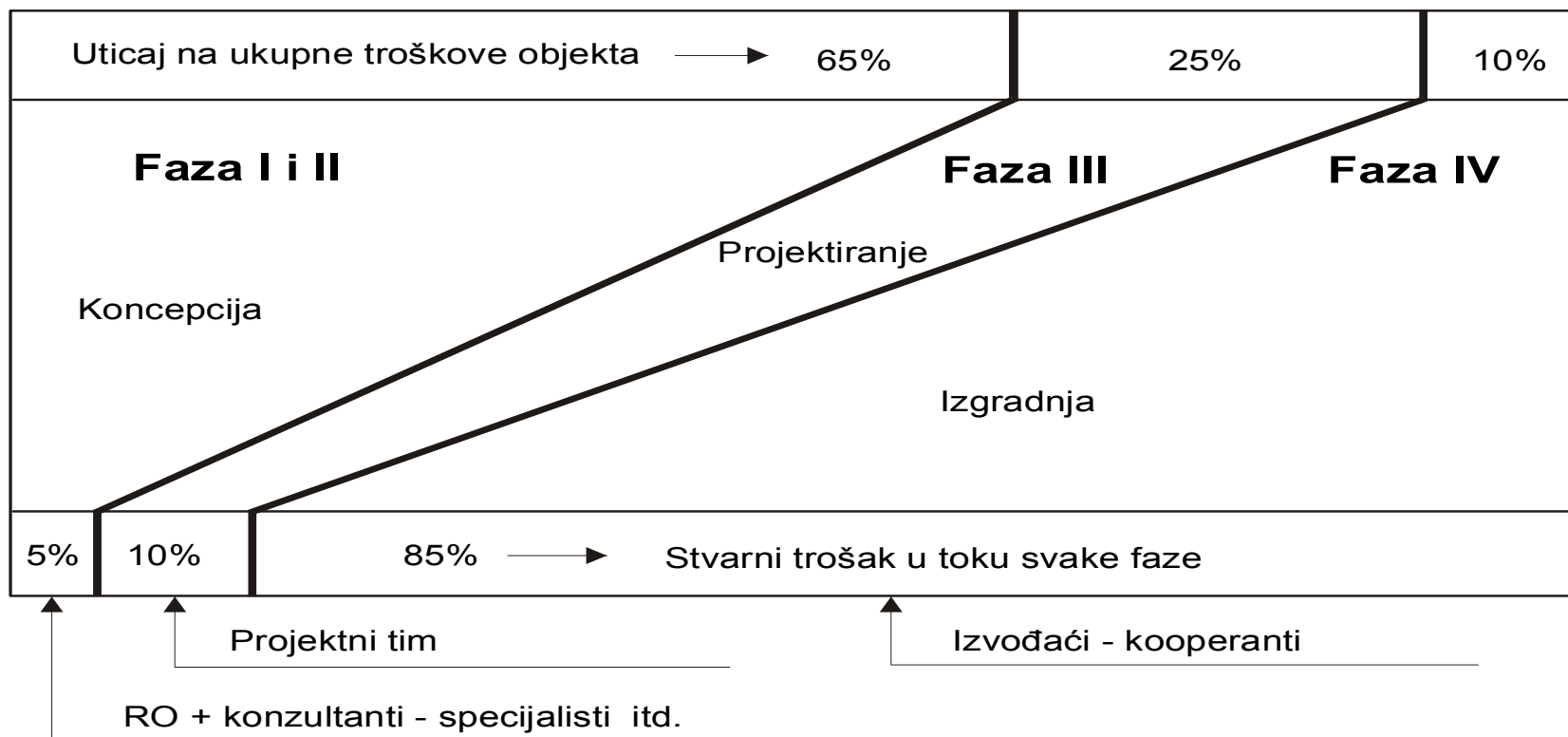
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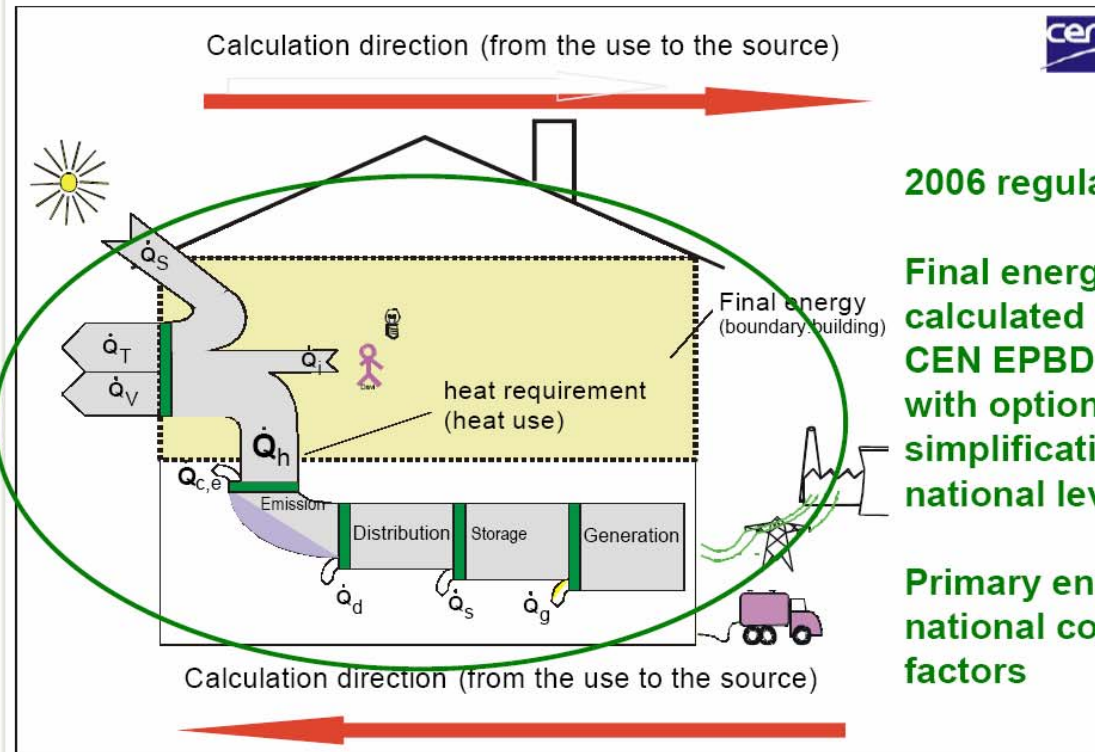


Utjecaj pojedinih faza na cijenu sustava



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Method of calculation useful, final, primary energy – Directive EPBD (2002/91/EC), CEN



2006 regulation:

Final energy
calculated based on
CEN EPBD standards
with optional
simplifications on
national level

Primary energy -
national conversion
factors

I – METHODOLOGY OF CALCULATION OF INTEGRATED ENERGY PERFORMANCE OF BUILDING

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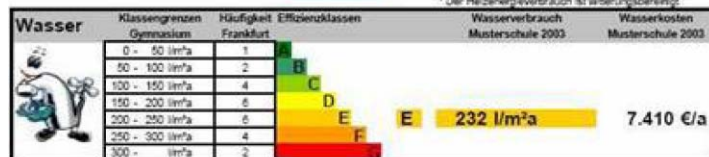
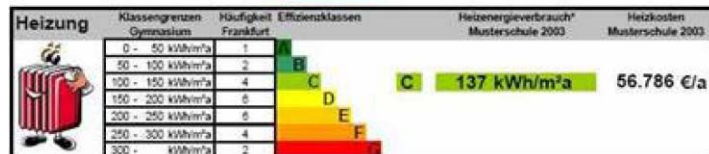
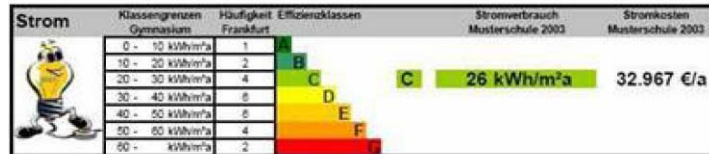
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Europa – energetske iskaznice

Energie- und Wasserverbrauch 2003

Liegenschaft:	Musterschule	Netto-Fäche:	9.982 m²
Adresse:	Oberweg 5	Nutzungsart:	Gymnasium



Kosten für Energie und Wasser 2003: 7,35 €/m²a 73.344 €/a

Diese Kosten werden beeinflusst durch den baulichen Zustand und das Nutzerverhalten

Mögliche bauliche Maßnahmen	Schätzkosten	ca. Einsparung
Dämmung der obersten Geschossdecke	16.000 €	3.250 €/a
Sanierung der Beleuchtung	25.000 €	1.500 €/a

Das Nutzerverhalten beeinflusst die Kosten mit ca. 15 % = 11.002 €/a

Daher bitten wir Sie:

- Schalten Sie die Beleuchtung bei ausreichendem Tageslicht ab
- Lüften Sie in der Heizperiode nur kurz und stoßweise
- Nutzen die Sparfunktion an den Toilettenspülungen

Das nützt der Umwelt und den Steuerzahlern!

Weitere Einspartipps und Informationen erhalten Sie unter: www.stadt-frankfurt.de/energiemanagement

Energieverbrauchs-Ausweis

Gymnasium St. Georg in Horn
 Querkamp 68
 22547 Hamburg - Horn
 Baujahr: 1968
 Gebäudeart: Gymnasium

Effizienzklasse	Heiz-Energie Jahres Verbrauch	Strom Jahres Verbrauch	CO ₂ Jahres Emissionen	Trinkwasser Jahres Verbrauch
B	190 kWh pro m ²	89 kWh pro m ²	54 kg pro m ²	815 Liter pro Person
D	166 kWh pro m ²	63 kWh pro m ²	41 kg pro m ²	4.875 Liter pro Person

Durchschnittswert in dieser Gebäudeklasse

Verbrauchs-Entwicklung Heiz-Energie (berec 4 Jahre, 2001 = 100%)

Erläuterungen
 2001 wurden Fenster erneuert und die Außenwände mit einer Varmiedelschicht versehen.

Beheizte Nutzfläche: 6.184 m² Zahl der Nutzer: 650 Ausgewertete Jahre: 2001 - 2004

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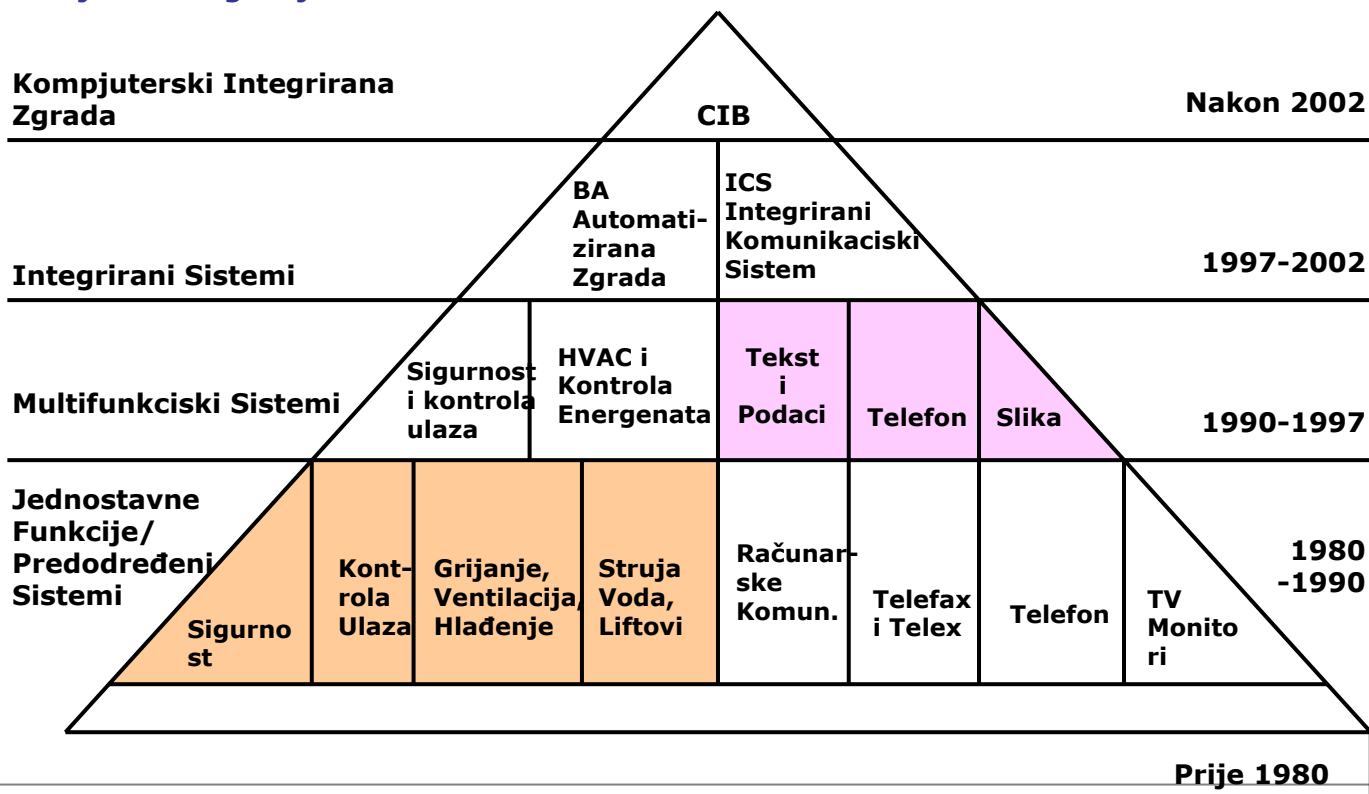
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Sustavi u zgradi

Prosječni Integracijski Nivo

Razvojni Period



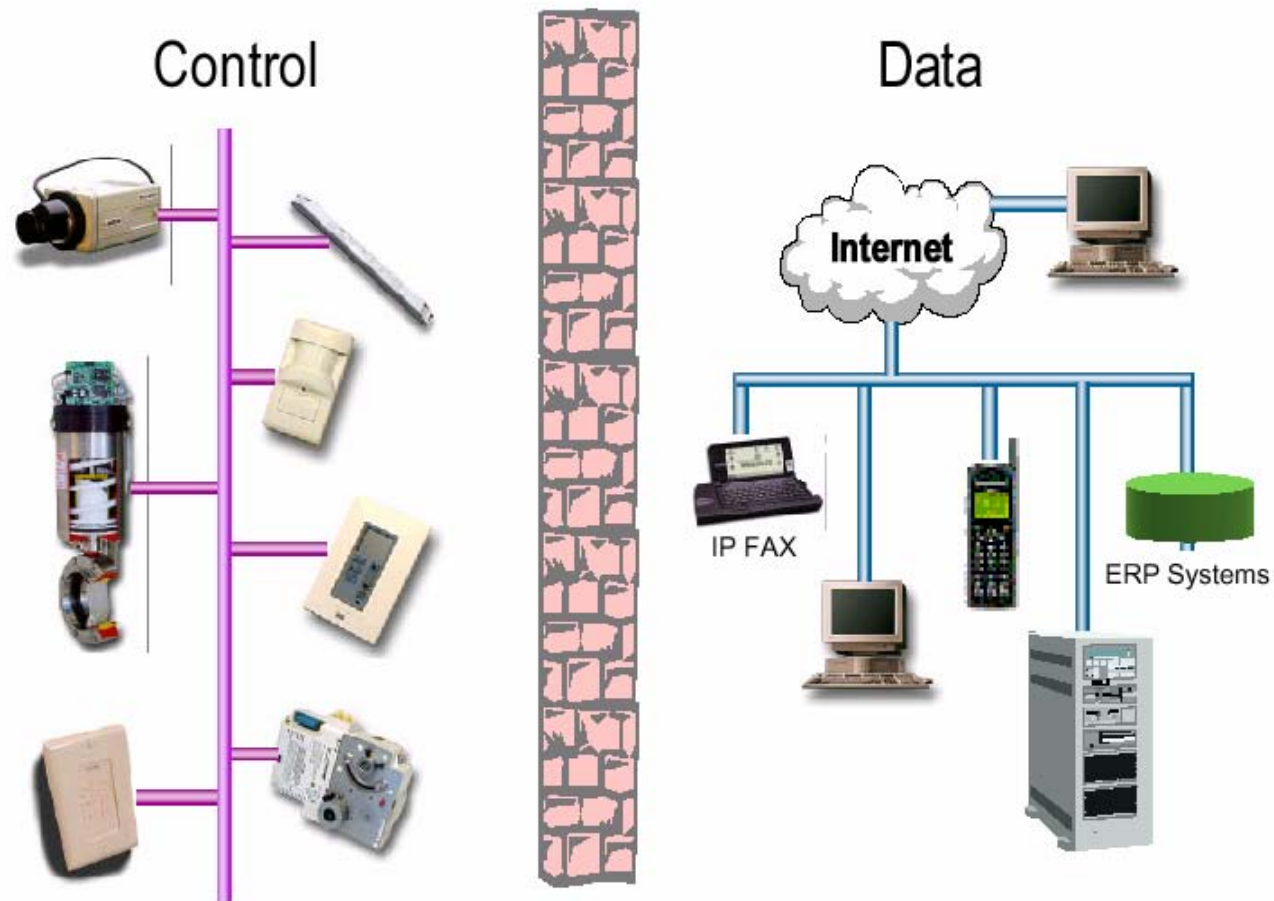
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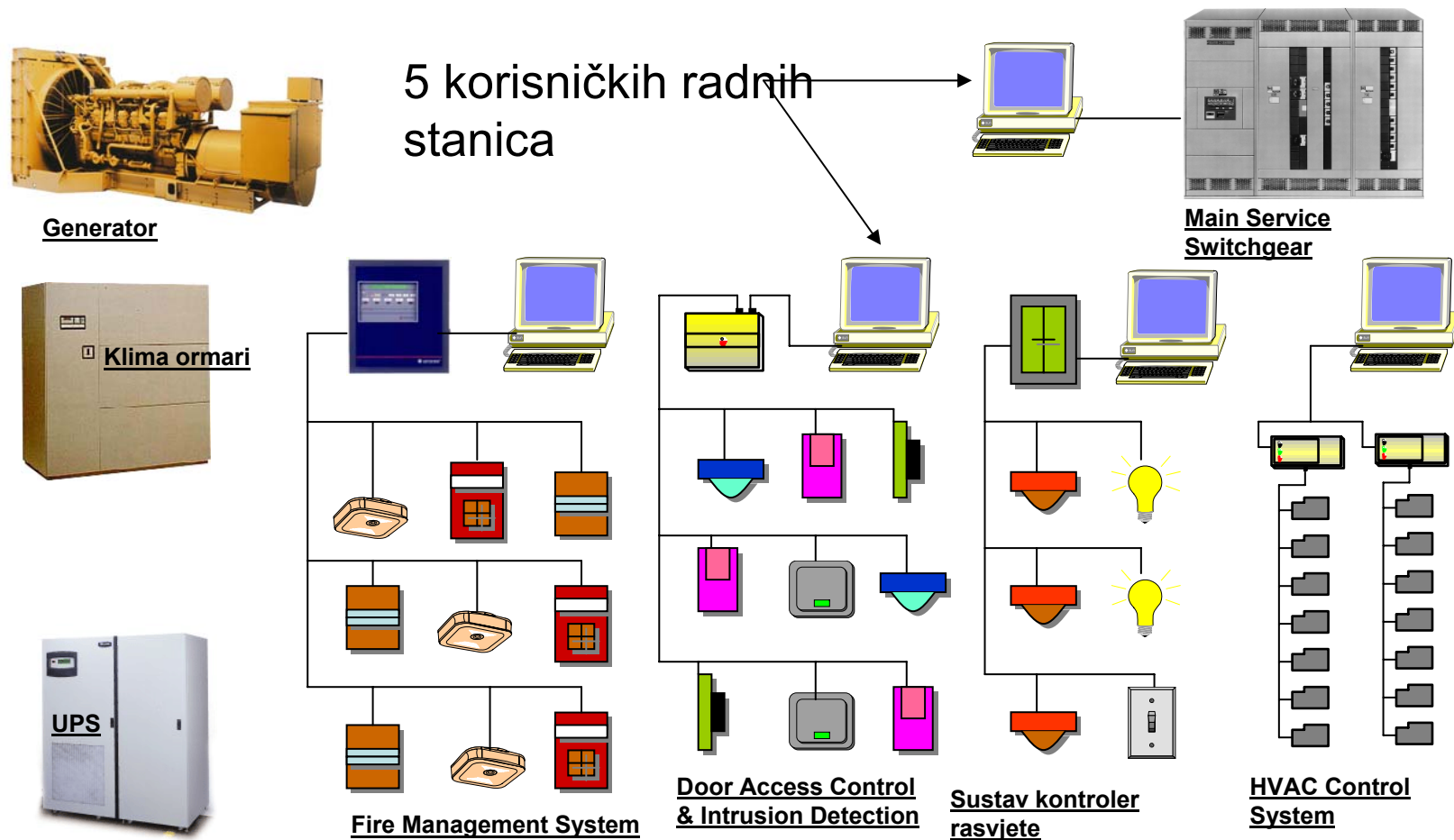


Dva različita svijeta



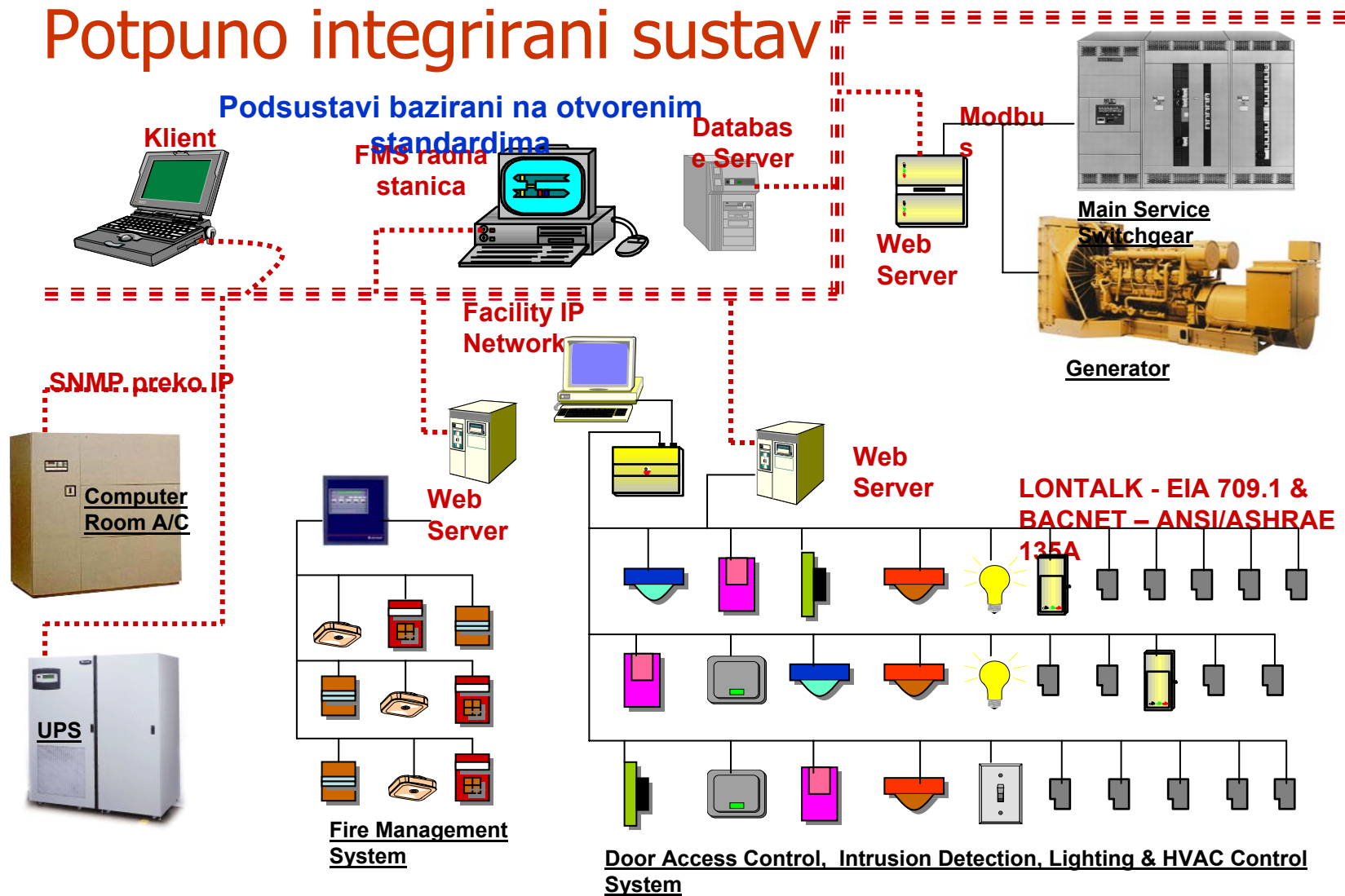
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Tipičan način izgradnje nadzorne arhitekture



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Potpuno integrirani sustav



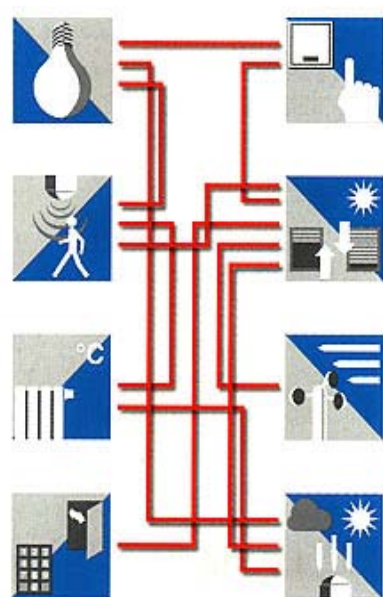
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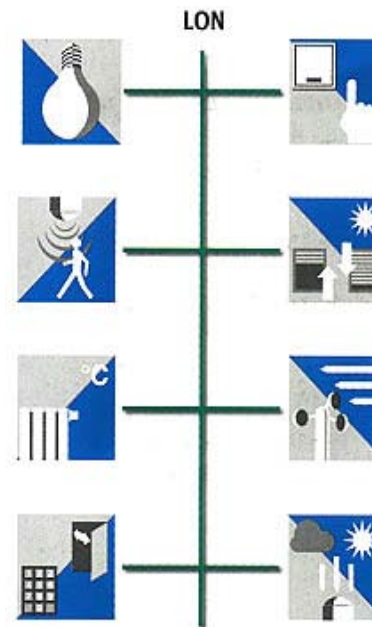
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Inteligencija izvan žica



Tradicionalna mreža



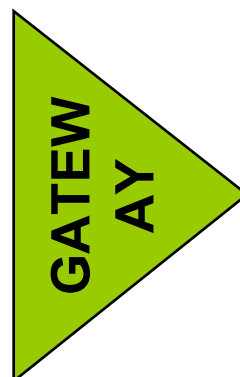
Paketna mreža

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Prihvaćanje svijeta otvorenih komunikacija

Proprietary protokoli

MODBUS



LONMARK[®]
INTERNATIONAL



OBIX[™]

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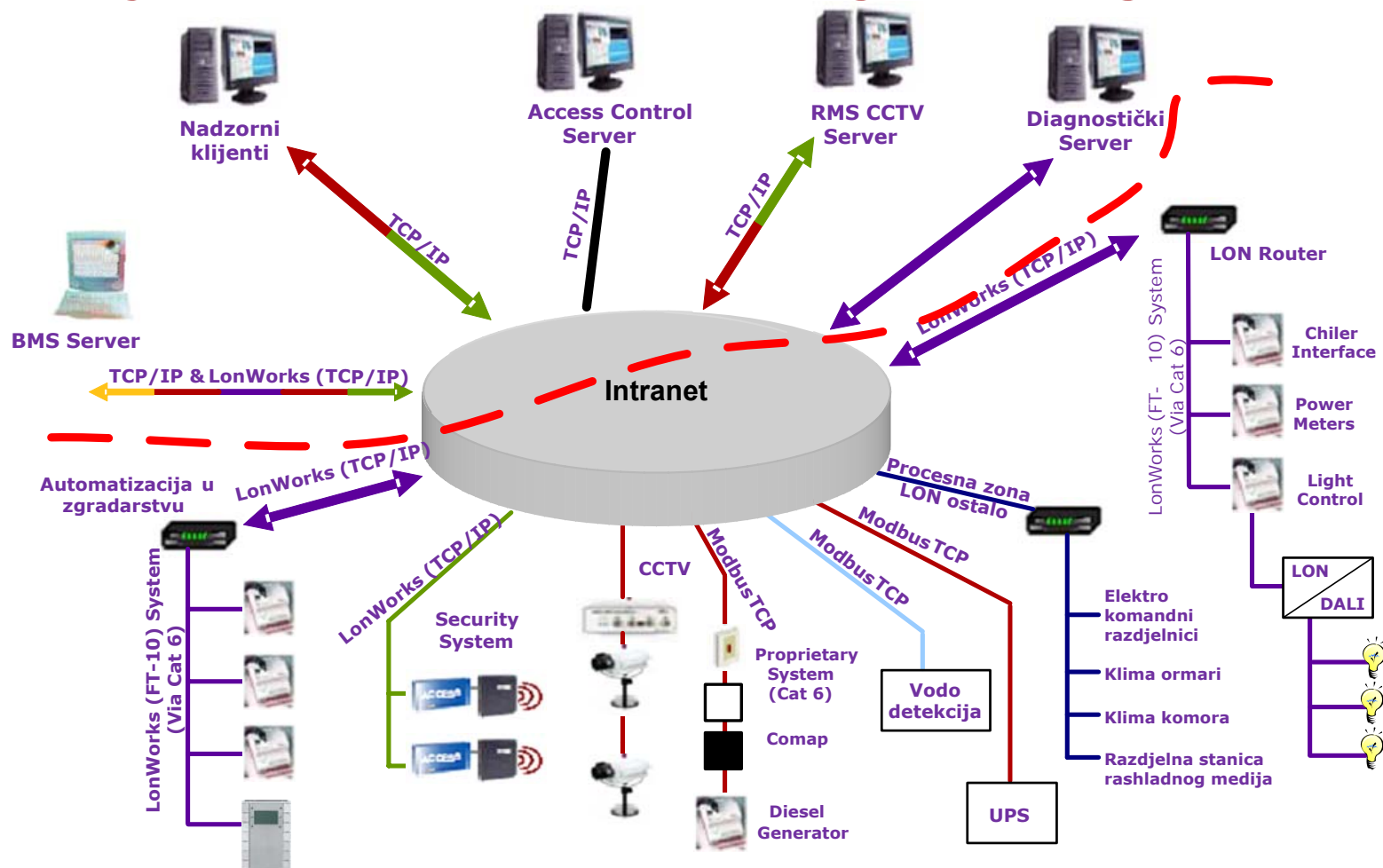
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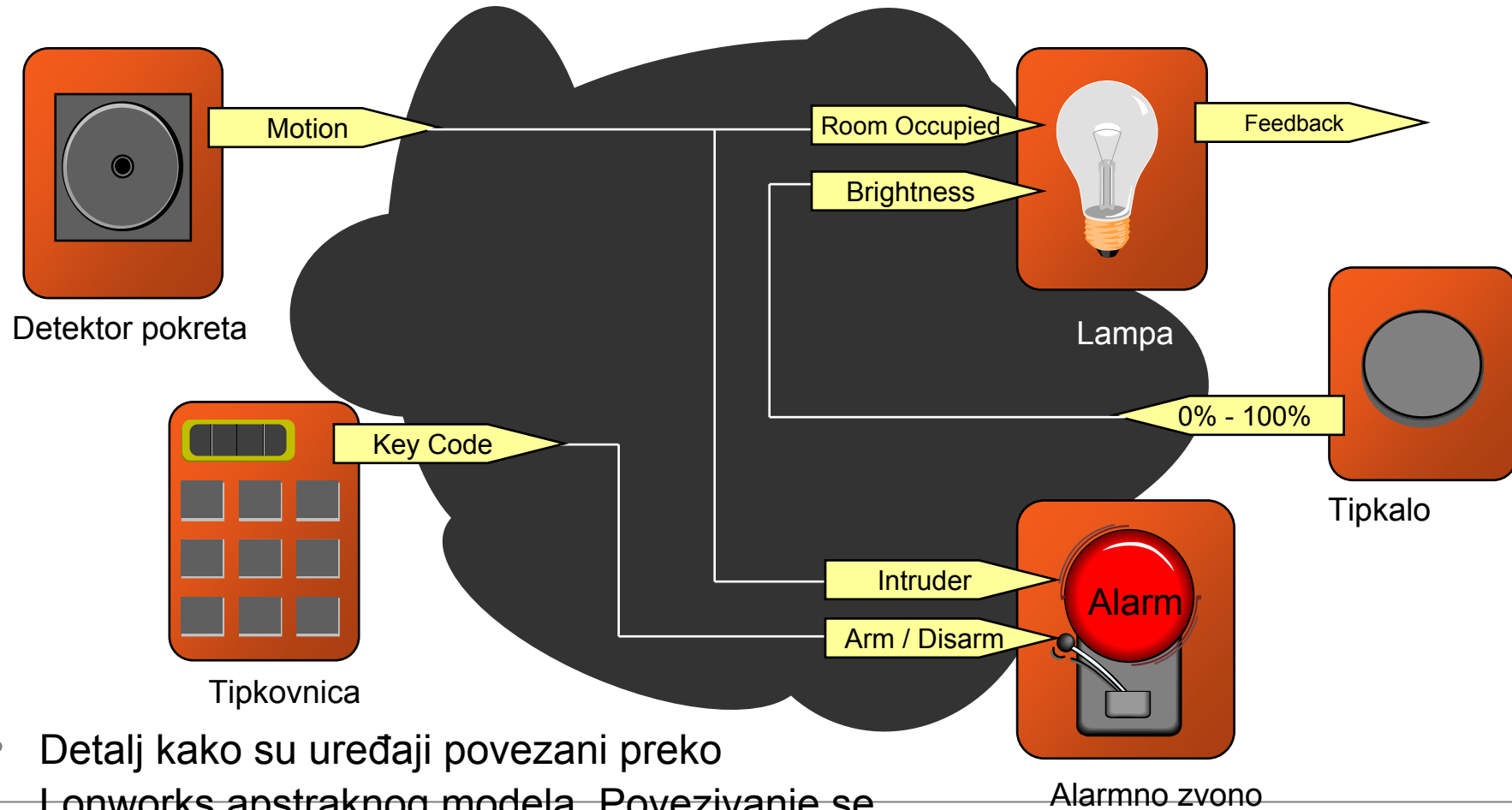


Primjer otvoreni sustava izgrađenog 2002



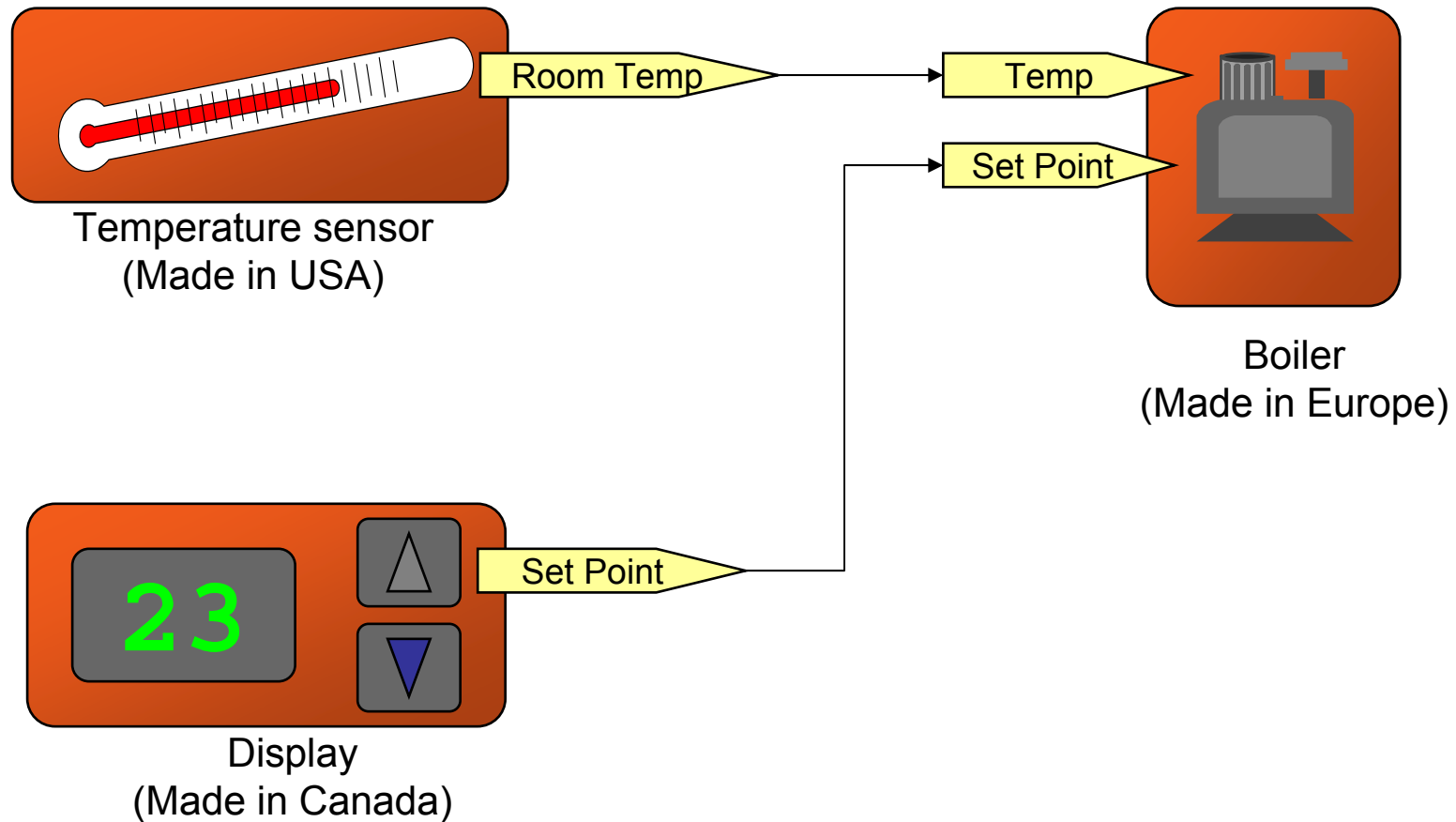
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Informacijski bazirani sustav



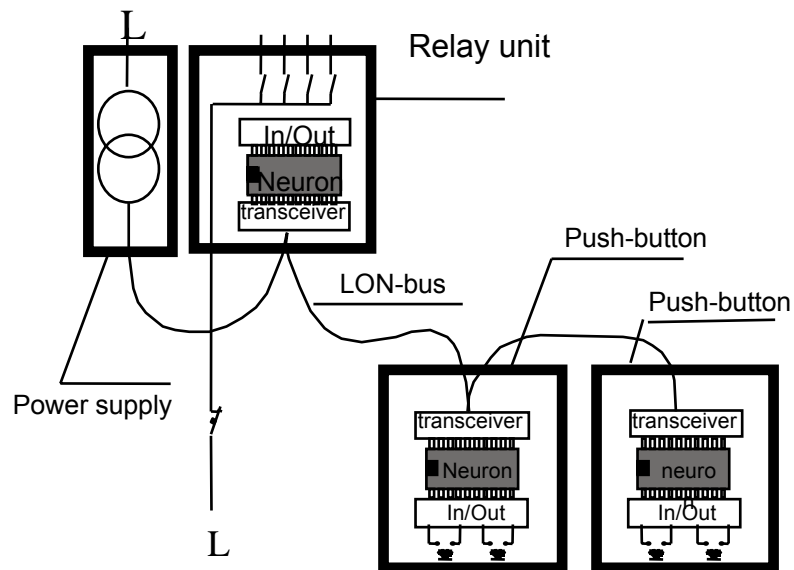
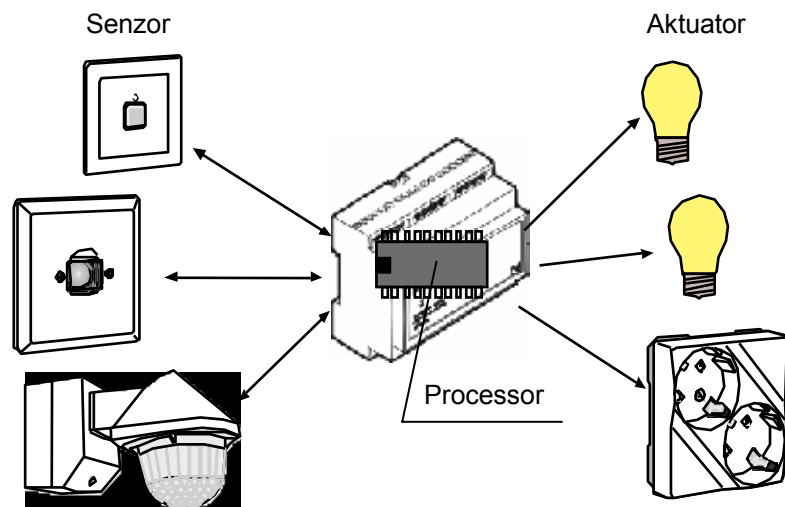
- Detalj kako su uređaji povezani preko Lonworks apstraknog modela. Povezivanje se može dogoditi u bilo kojem trenutku bez uticaja na sam program u uređaju.

Otvoreni sustav



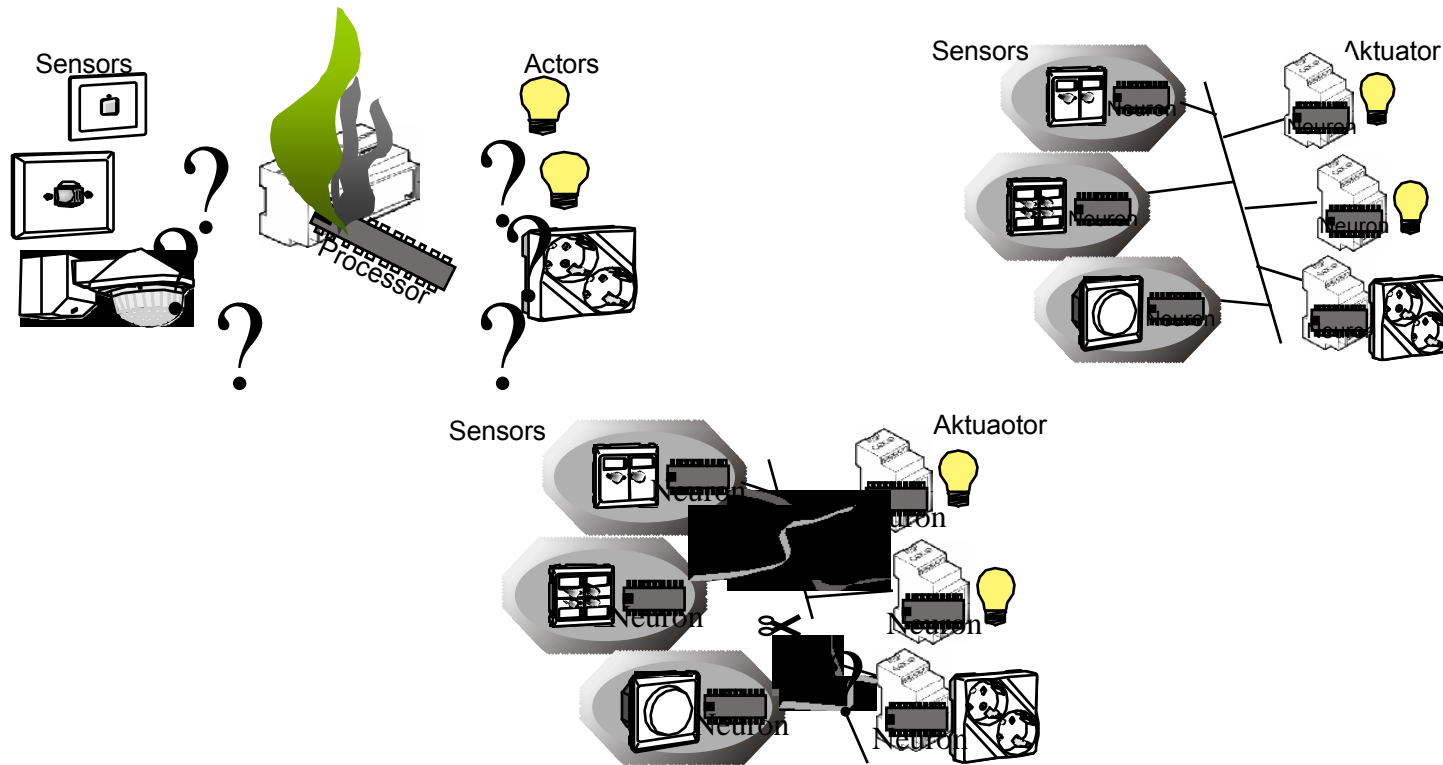
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Centralizirani prema distribuiranom sustavu



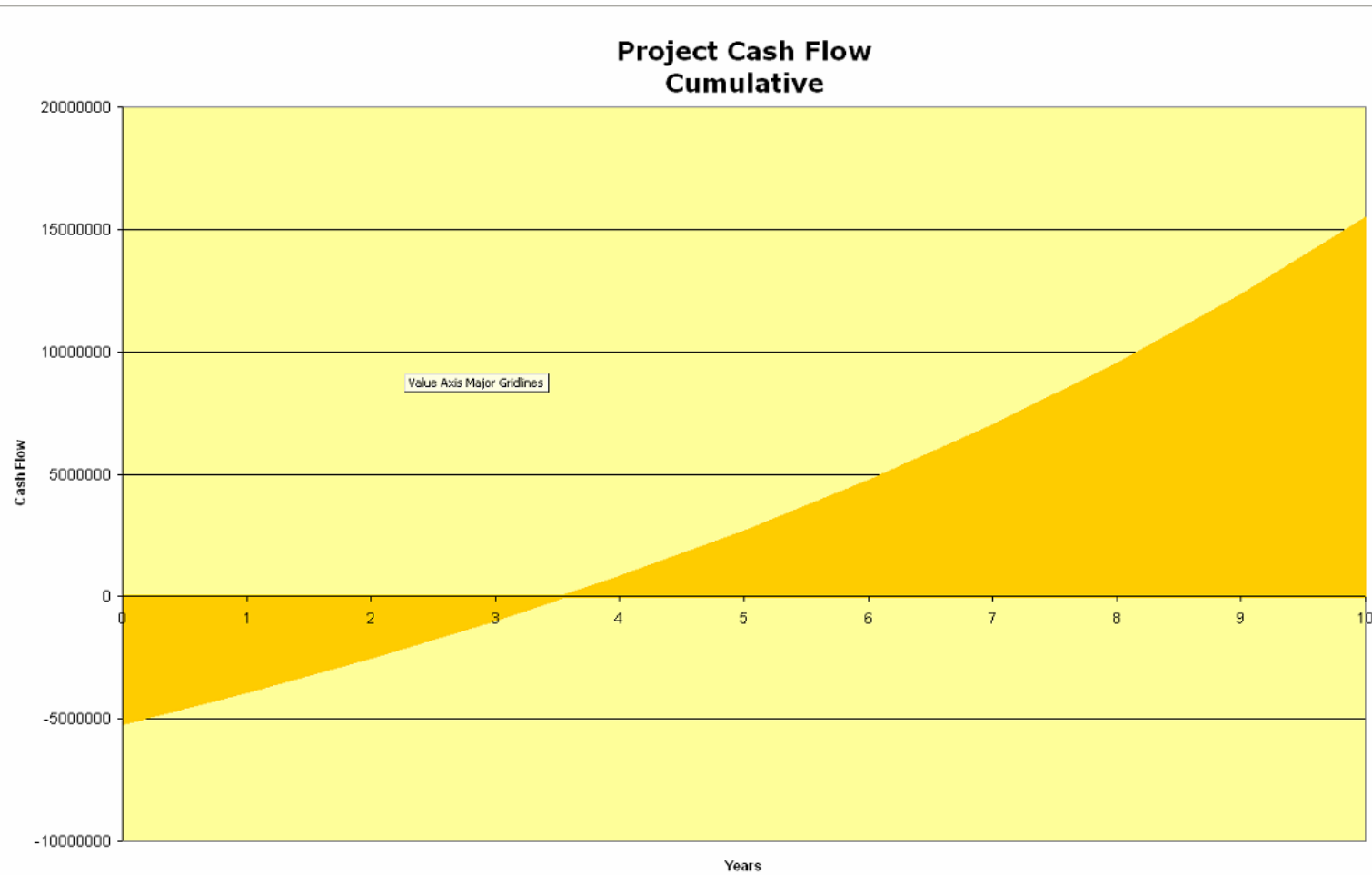
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Situacija greške na sustavu

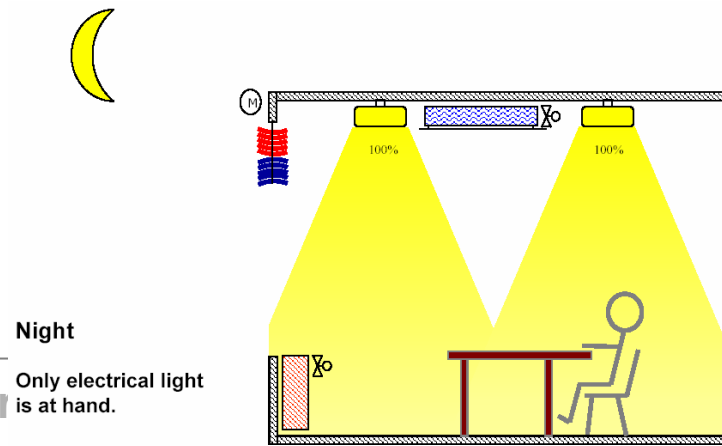
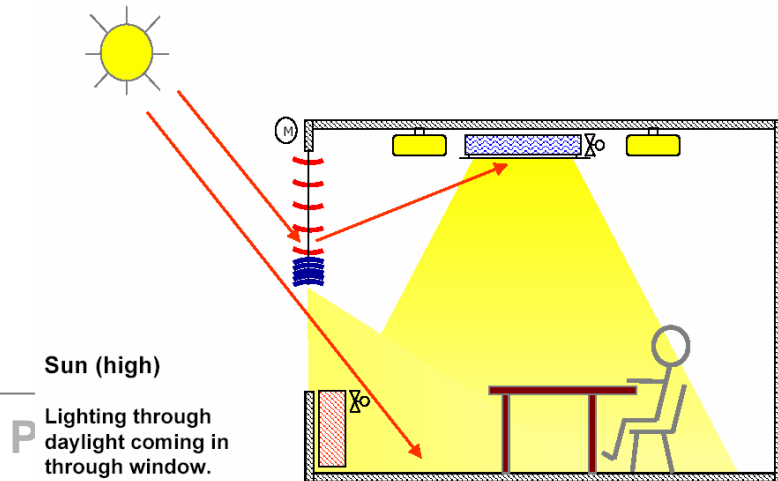
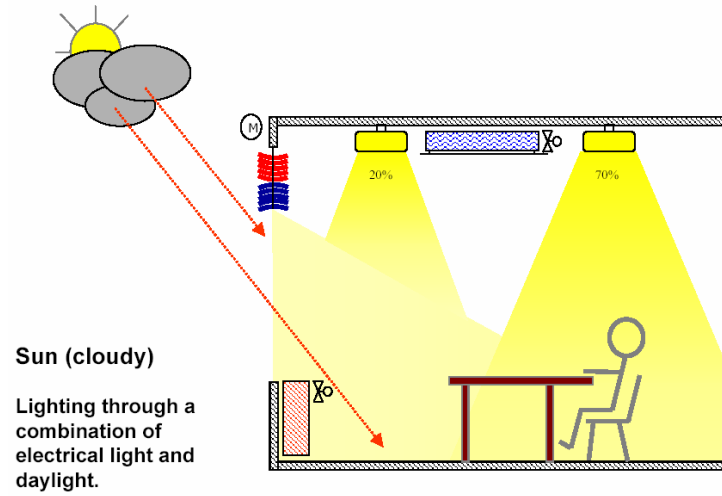
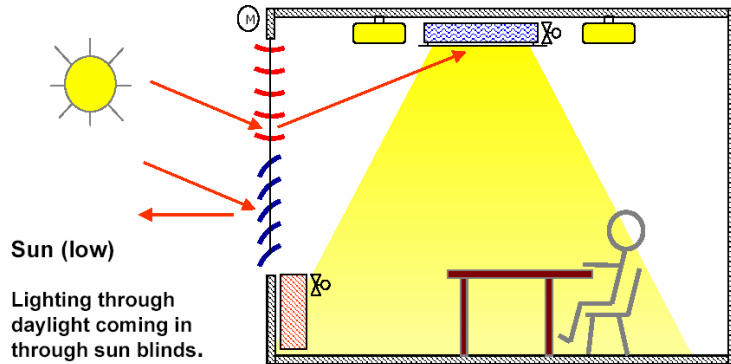


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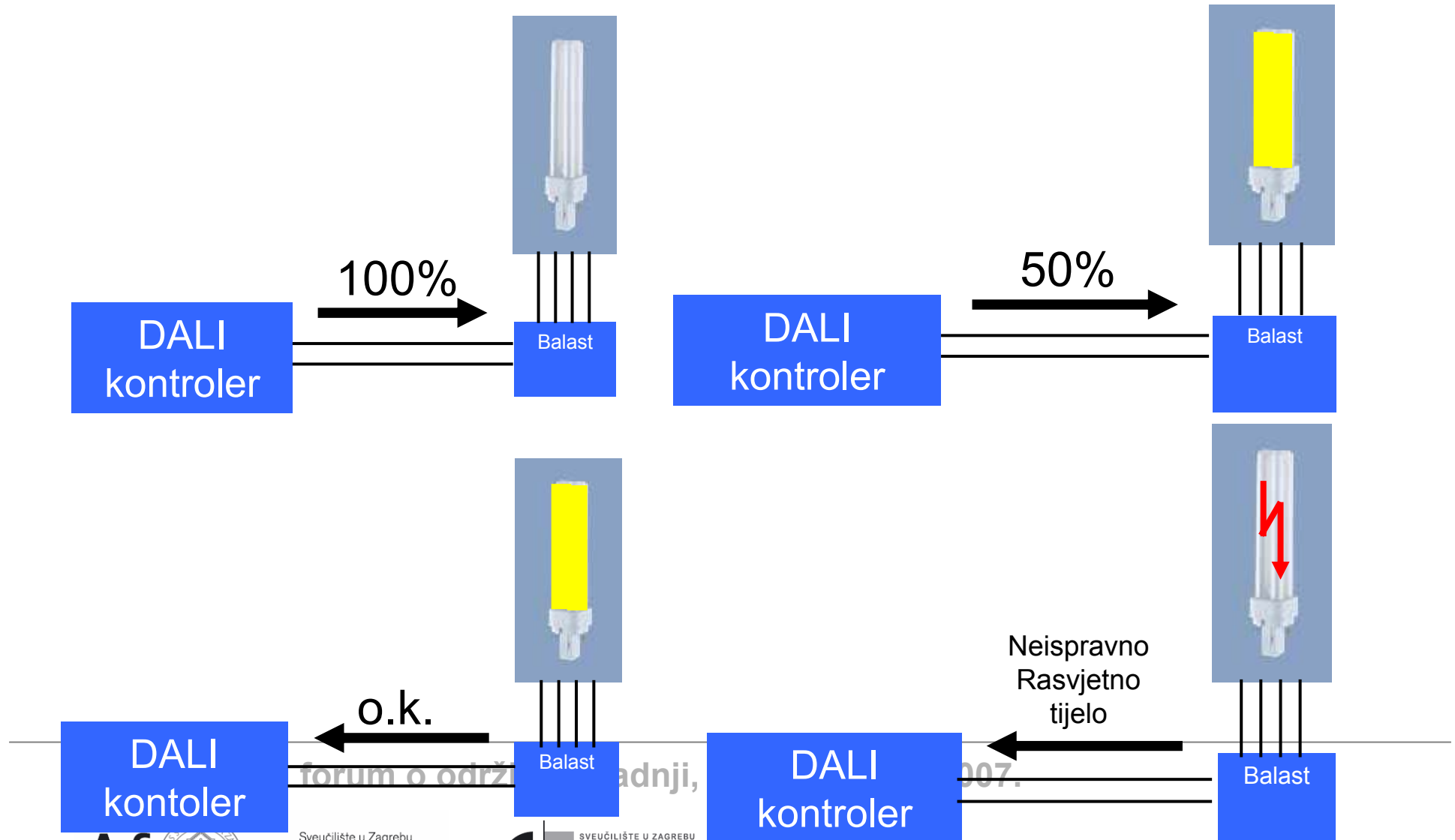
Analiza – isplativost investicije



Grijanje, hlađenje, rasvjeta

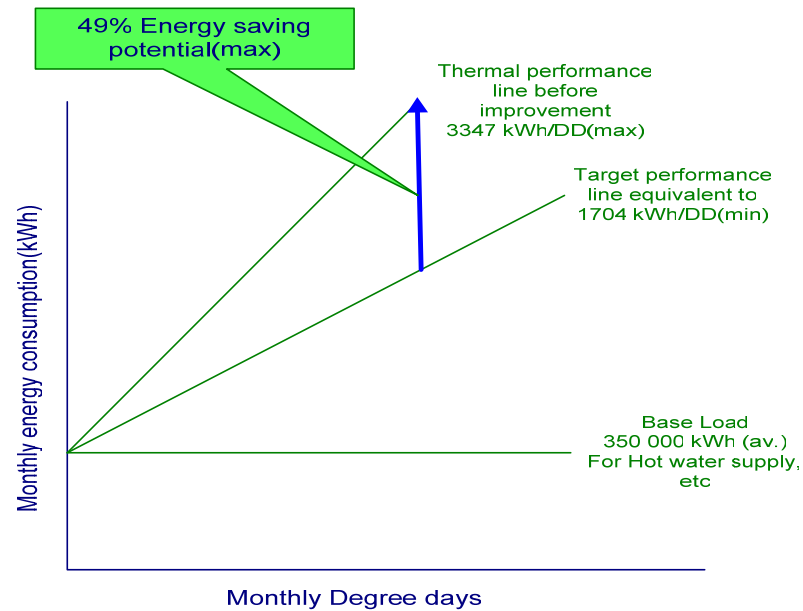


Upravljanje rasvjetom



Index kao pokazatelj ne-efikasnosti sustava

	velja	ožuja	trava	Svib	Lipa	Srpa	Kolov	Ruja	Listo	Stud	Prosi	
Month	sij.05	ča	k	nj	anj	nj	nj	oz	n	pad	eni	nac
DD	5	242,2	5	123	0	0	0	0	0	0	129	5
kWh/	76	23	56	24	59	65	85	9	60	2	50	3
DD	1822	1704	2298	3347	***	***	***	***	***	***	3221	2393



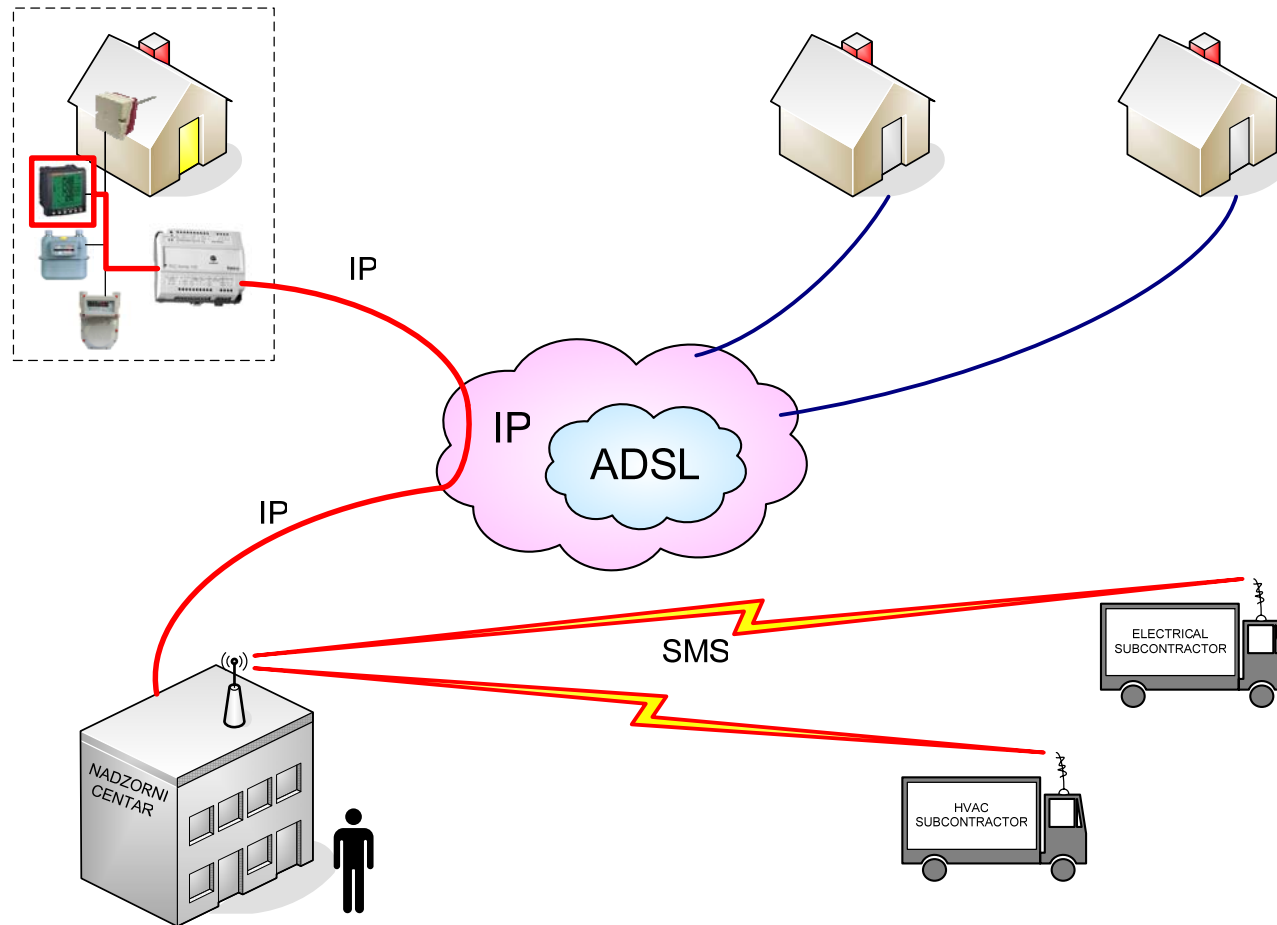
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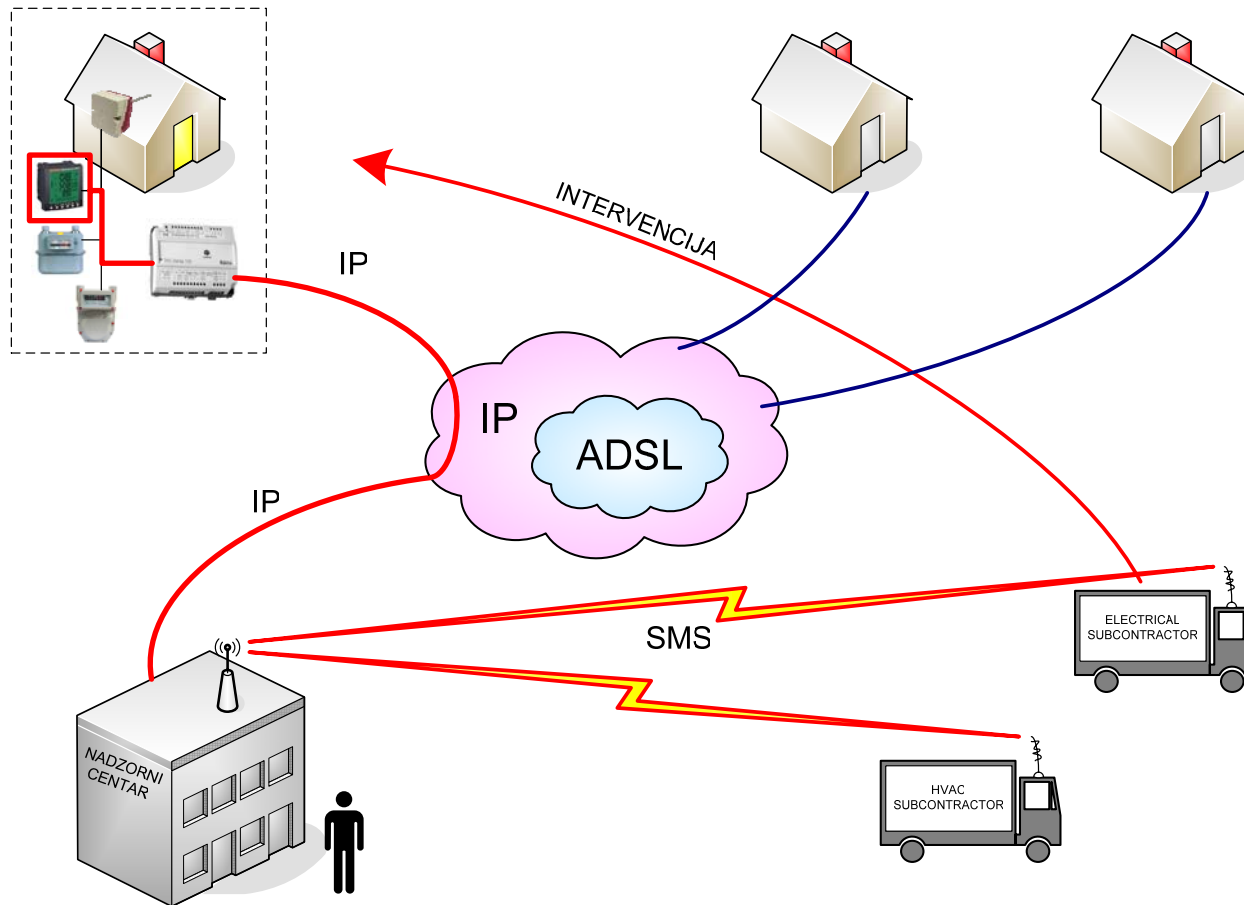


Diagnostika



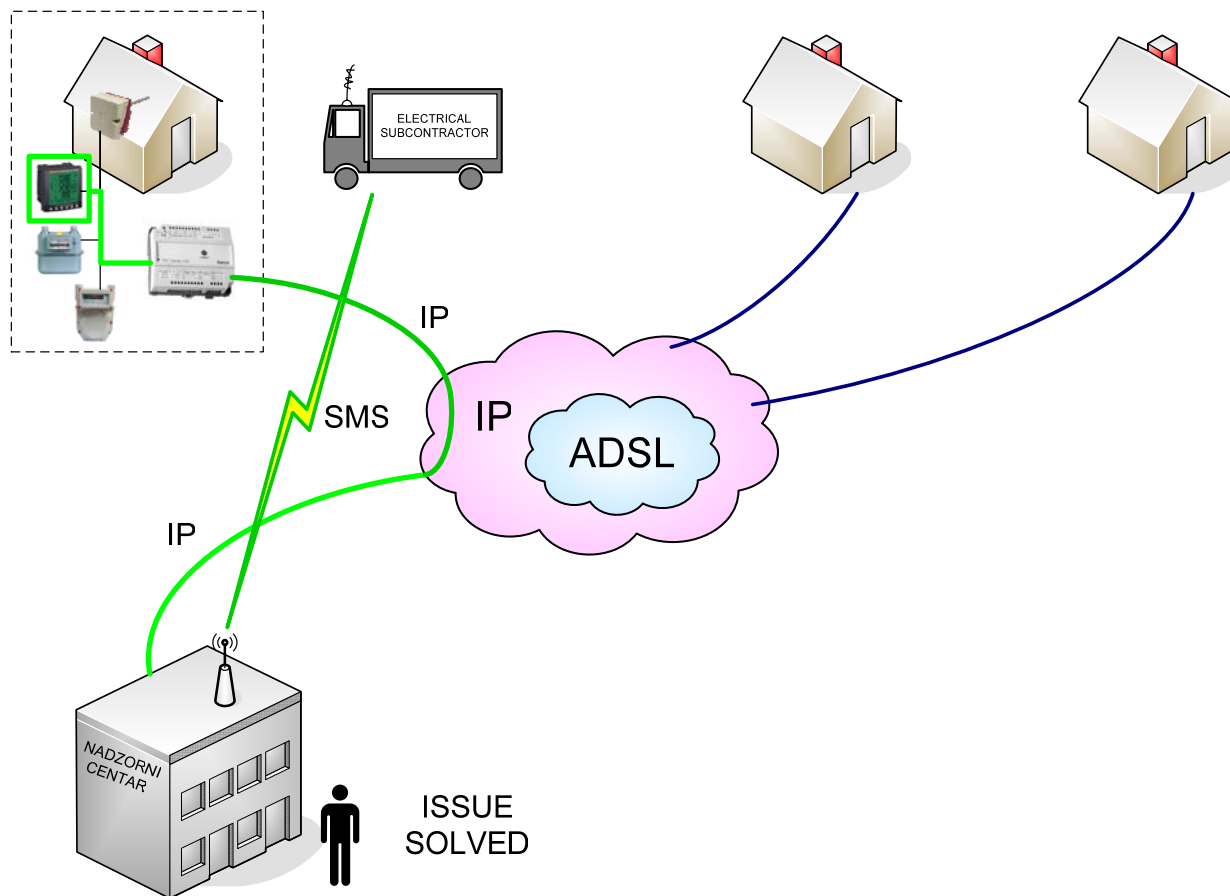
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Servisna intervencija



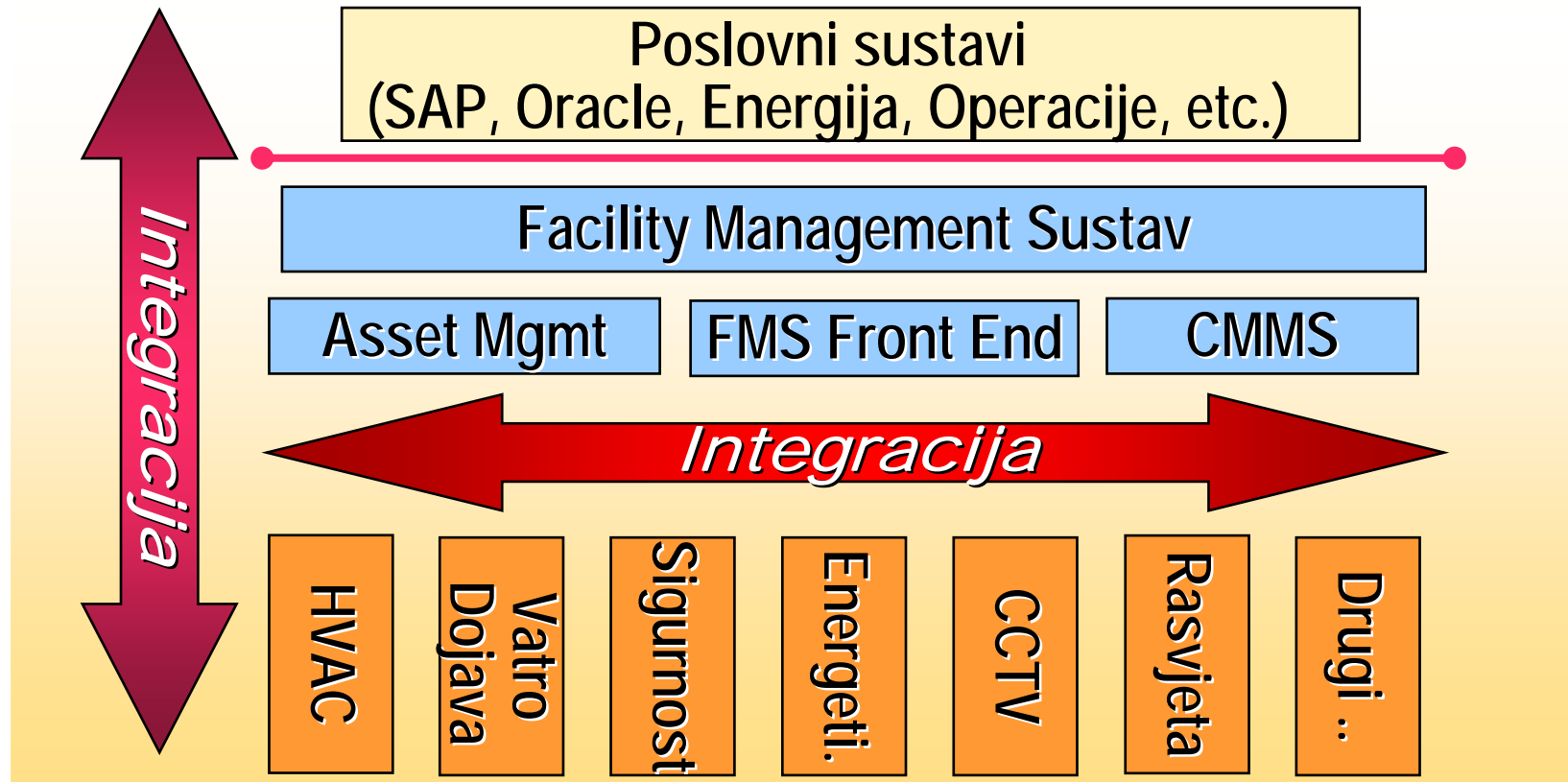
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Uspostavljanje redovnog stanja



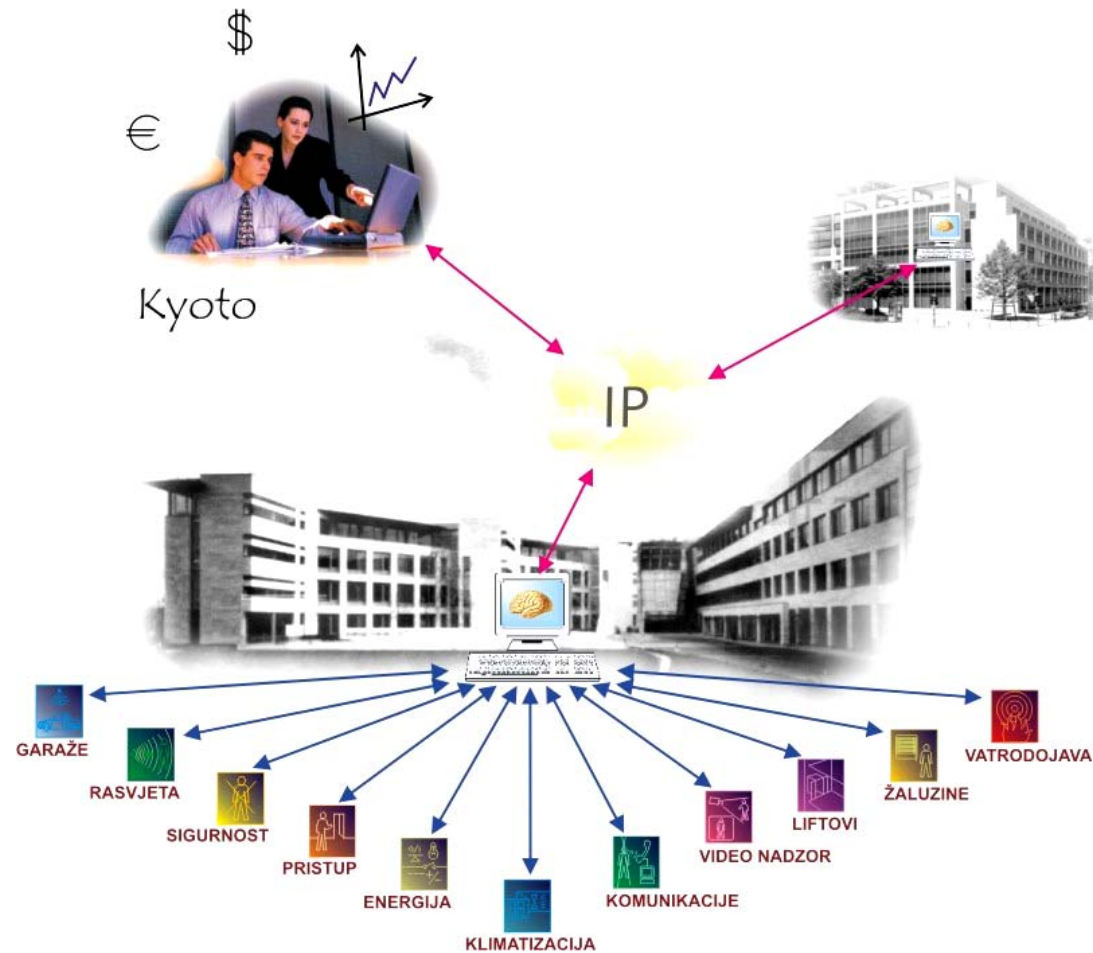
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Vertikalna integracija nadzora



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Koncept inteligentne zgrade



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Sistem integrator nove generacije

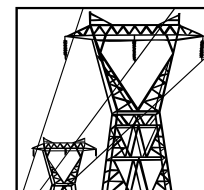
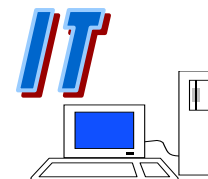
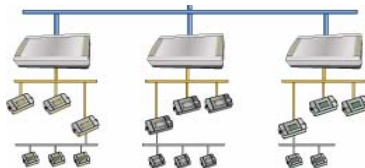


INTERNET
Web Servisi



ESCO tvrtke

**Ne samo
DDC
Contractor**



Utilities

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Kompatibilni s energetsom budućnošću!

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Hvala!

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