

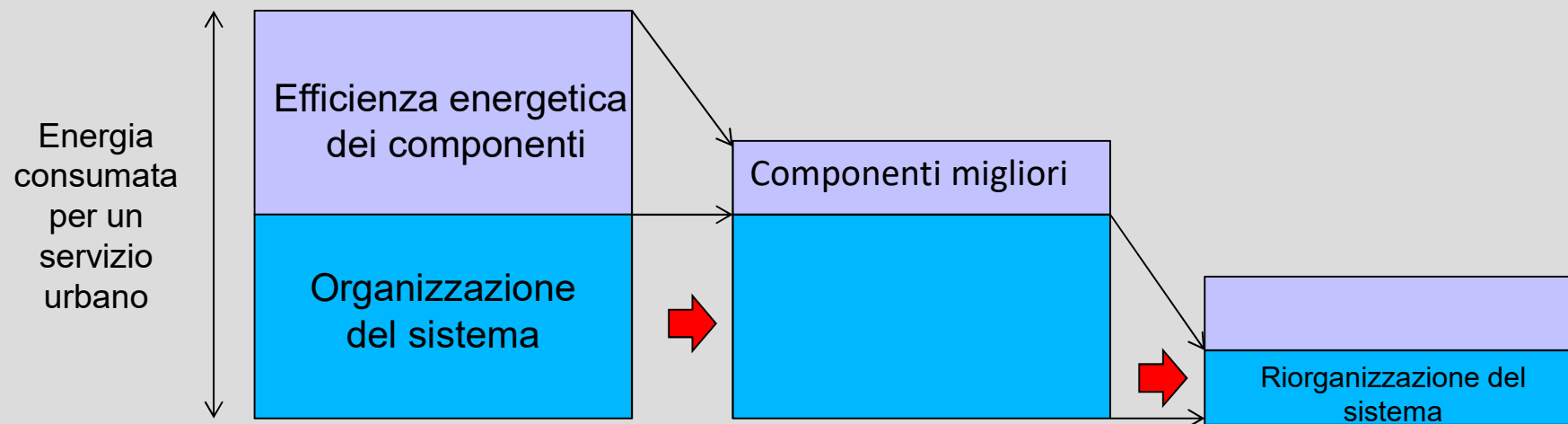
Prospettive e Tecnologie per le Smart Cities

Mauro Annunziato

ENEA
Dir. Divisione Smart Energy



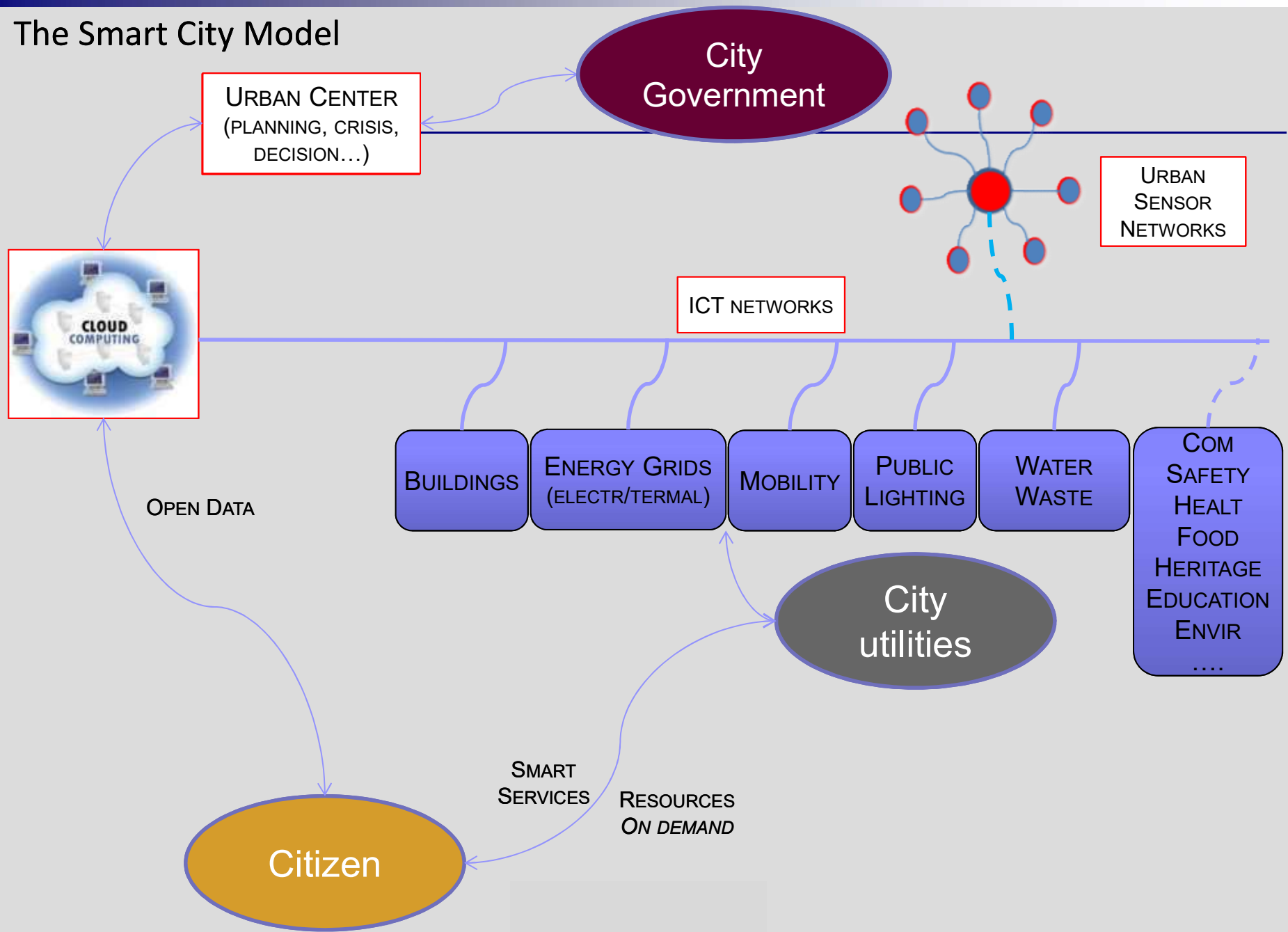
dalla efficienza energetica ...alla Smart City



Energy on demand



The Smart City Model



The urban ecosystem

*...from static city
...to a city adapting to people needs*



*Resource on
demand*



*Sensor networks
and interactivity
(IoT)*



Open data



*Computation
intelligence*



*Flexibility on
urban utilities*



*Smart
Services*



I domini applicativi

Main reference: **Confindustria** (Confindustria-ENEA-RSE task force on Smart Energy – Smart Cities)

Technologies for City Planning and Government

Urban center: open data, environ. monit, climatic emergencies, energy prod/cons, transport, safety, crisis management.

Sanità e scuola digitale

Main references: **Confindustria Digitale**

Urban Networks

Energy grids: smart grids (electrical+thermal, active demand, electric/ gas smart meters, citizen consciousness).

Smart Lighting: led, smart poles, remote-management, smart services.

Smart Mobility: infomobility, electrical (fast recharge, elect vehicles, V2G, sharing, mobility on demand, business model).

Main references: **ANIE, Assoelettrica, Anima, Agesi, Confindustria Digitale**

Smart Buildings

Smart Buildings: public (office, schools, ...), mat/comp (heat pumps & solar cooling), automation, residential

Smart homes: smart appliances, micro-generation, domotics, remote connection, smart services.

Building Network Management: monitoring, remote diagnostics, optimization and active demand.

Main references: **ANIE, Assoimmobiliare, ANCE, FINCO, CECED, OICE**

Environmental Resources

Water Management: monitoring, optimization, emergencies, water quality, distribution efficiency.

Smart Waste: collection, treatment, ICT cycle monitoring.

Main references: **FISE Assoambiente, Agesi, ANIE**

Smart Industrial Cluster

Energy conversion: industrial residuals, connection industrial-residential district.

Digital interoperability: industrial district (exchange of matter, services & info).

Main references: **Anima, Agesi**

Electric system Efficiency

Electric System Management: Flexibility, Active Demand

Main references: **Assoutility**

Comparazione preliminare impatto macroeconomico

Tabella 41. - Risultati di impatto macroeconomico

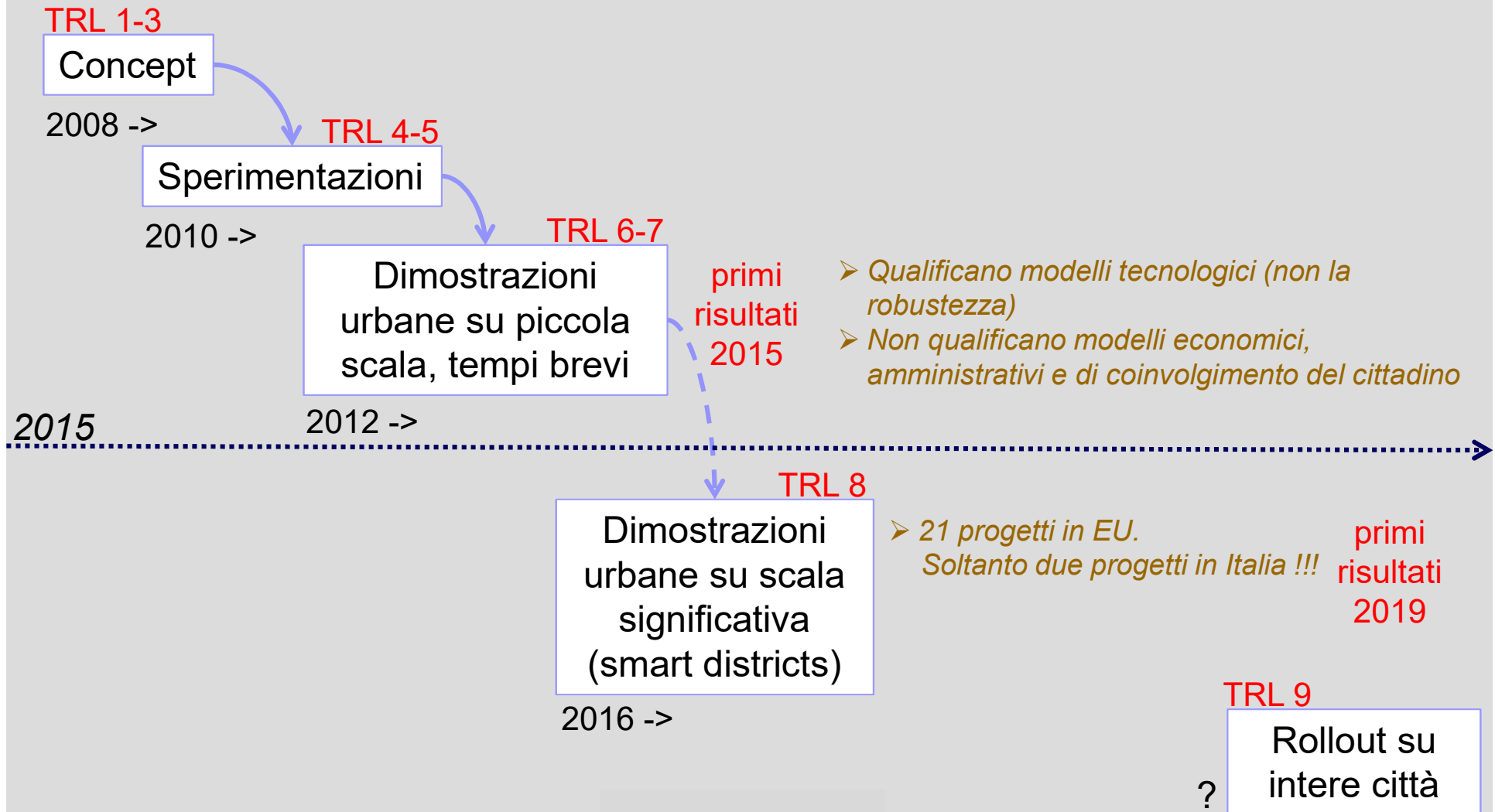
Hp aumento della domanda		Impatto sul sistema economico nazionale (2014-2020)					
BAU		Produzione	Valore aggiunto	Occupazione	Produzione	Valore aggiunto	Occupazione
(milioni di euro)		(milioni di euro)	(milioni di euro)	(migliaia di ULA)	(var. %)	(var. %)	(var. %)
Urban networks	2.114	3555,4	1283,8	18,6	0,12	0,09	0,08
Smart building	46.535	89.808,9	35.389,3	661,9	2,92	2,54	2,83
Industrial cluster	1.807	3115,8	1014,8	16,6	0,10	0,07	0,07
Totale*	50.455,7	97.094,5	37.967,0	701,7	3,16	2,72	3,00

Hp aumento della domanda		Impatto sul sistema economico nazionale (2014-2020)					
BAT		Produzione	Valore aggiunto	Occupazione	Produzione	Valore aggiunto	Occupazione
(milioni di euro)		(milioni di euro)	(milioni di euro)	(migliaia di ULA)	(var. %)	(var. %)	(var. %)
Urban networks	18.144	29866,9	10520,6	124,1	0,97	0,75	0,53
Smart building	271.151	531.438,3	212.116,3	4.056,8	17,30	15,20	17,34
Industrial cluster	5.029	8685,7	2872,4	46,5	0,28	0,21	0,20
Totale*	294.323,3	570.605,4	225.788,5	4.232,0	18,57	16,18	18,09

* Il totale generale non coincide con la somma degli incrementi stimati per i singoli progetti in quanto la valutazione complessiva è stata fatta imputando contemporaneamente l'aumento della domanda annua dal 2014 al 2020 in tutti i comparti interessati e ciò ha accentuato gli effetti diretti e indiretti sul sistema nazionale rispetto a quelli derivanti dalla somma dei singoli business case.

Fonte: CSC Confindustria

La roadmap – dove siamo ora ?



In Italia ?

Running

Ossevatorio Smart City ANCI: 1400 progetti

➤ *Scarsa integrazione, perlopiù settoriali*

Lighthouse cities:

➤ *Due soli progetti integrati di smart district (Milano, Firenze)*

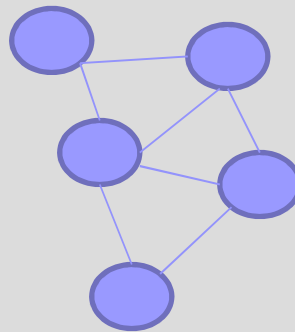
Programmi in avvio

PON Metro

Programma Smart
Cities MiSE

Programma Agenzia
per L'Italia Digitale

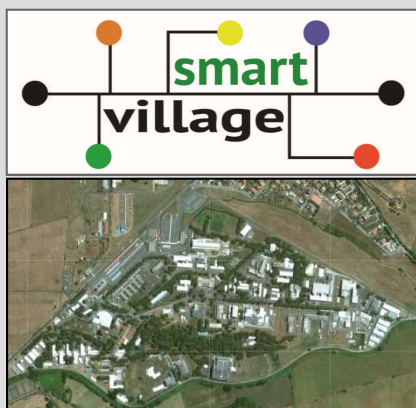
Fondi Strutturali



Arcipelago di isole o
reti di progetti replicabili ?



The map of Smart Cities projects of ENEA

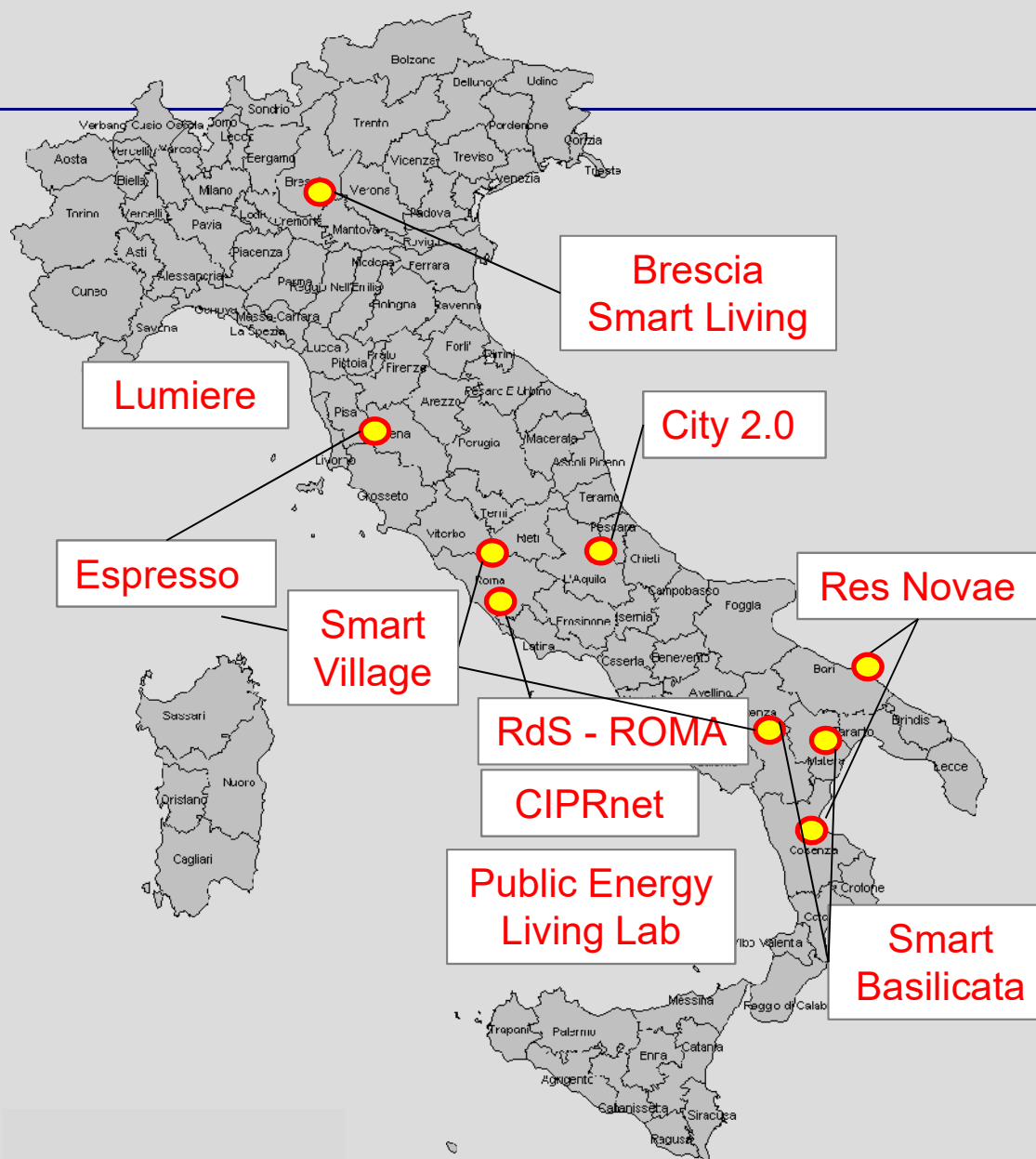


from Smart Village...



to the cities

...





Smart Cities & Communities

Ricerca di Sistema

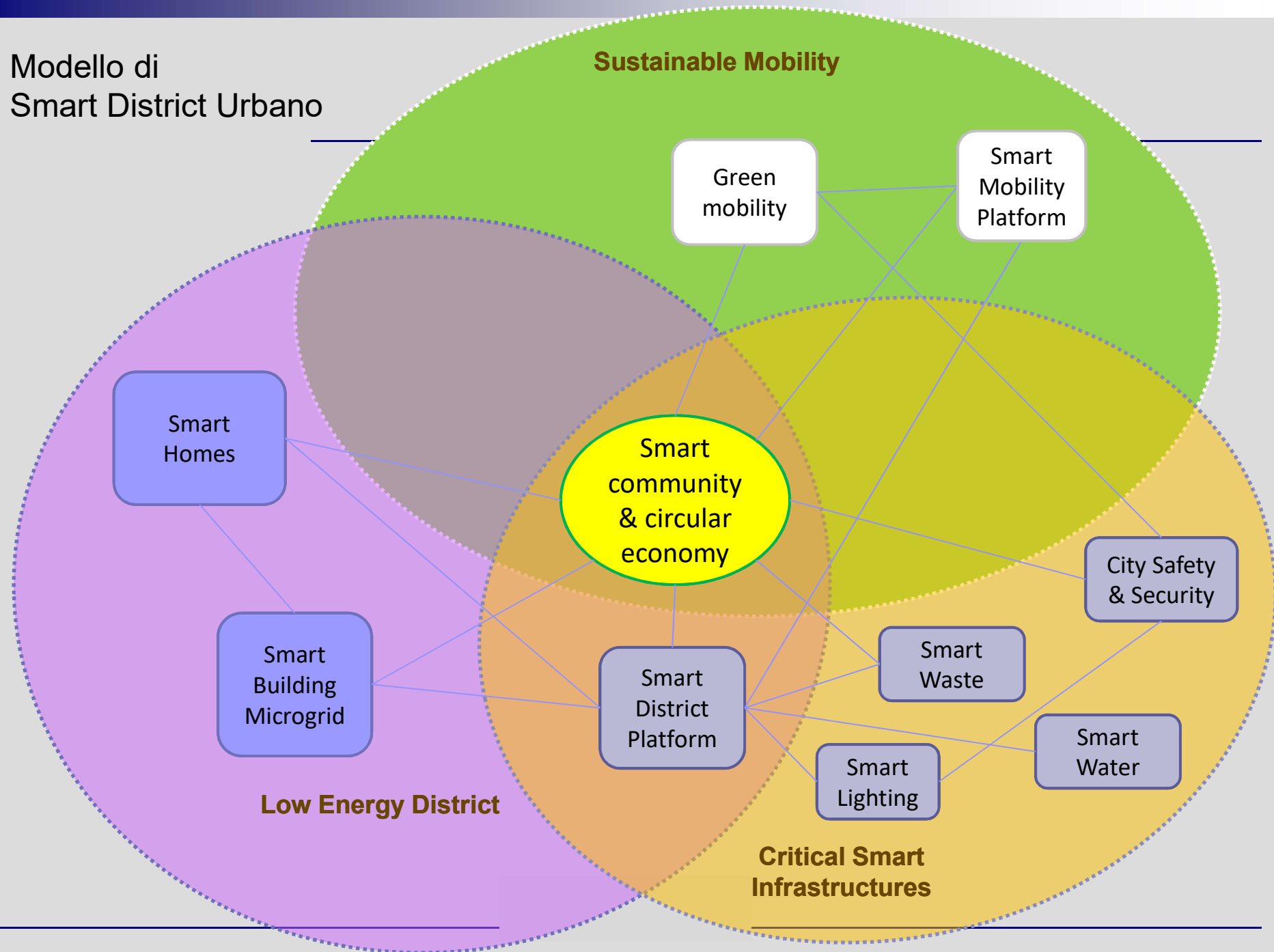
Budget: 8.7 ML euro + 5 ML euro(mobility)

Duration: 15 – 18

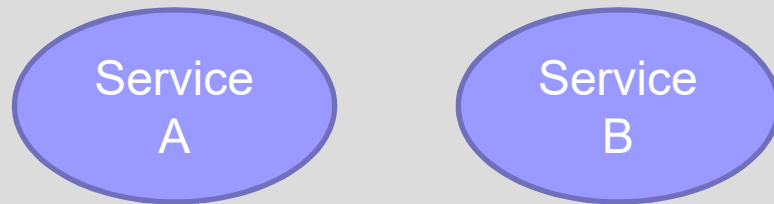
Coordination: ENEA

Partners: companies, universities, municipalities

Modello di Smart District Urbano

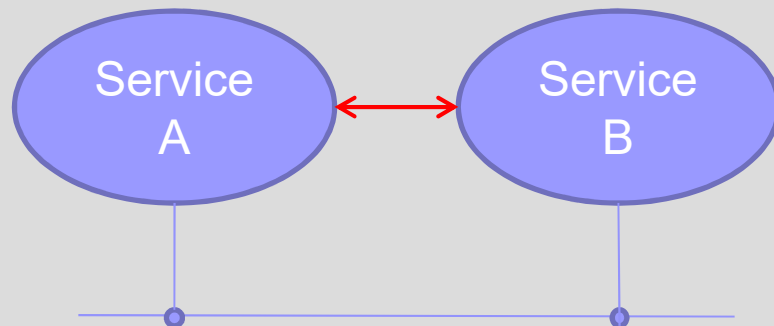


Inter-operability and integration



1. Separated Services

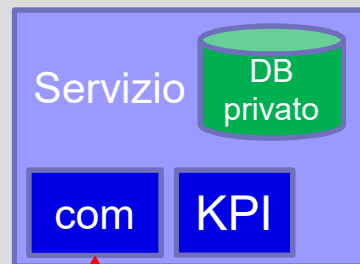
Non smart



2. **Integrated** services:
Through data exchange they
offer better performances and
new services

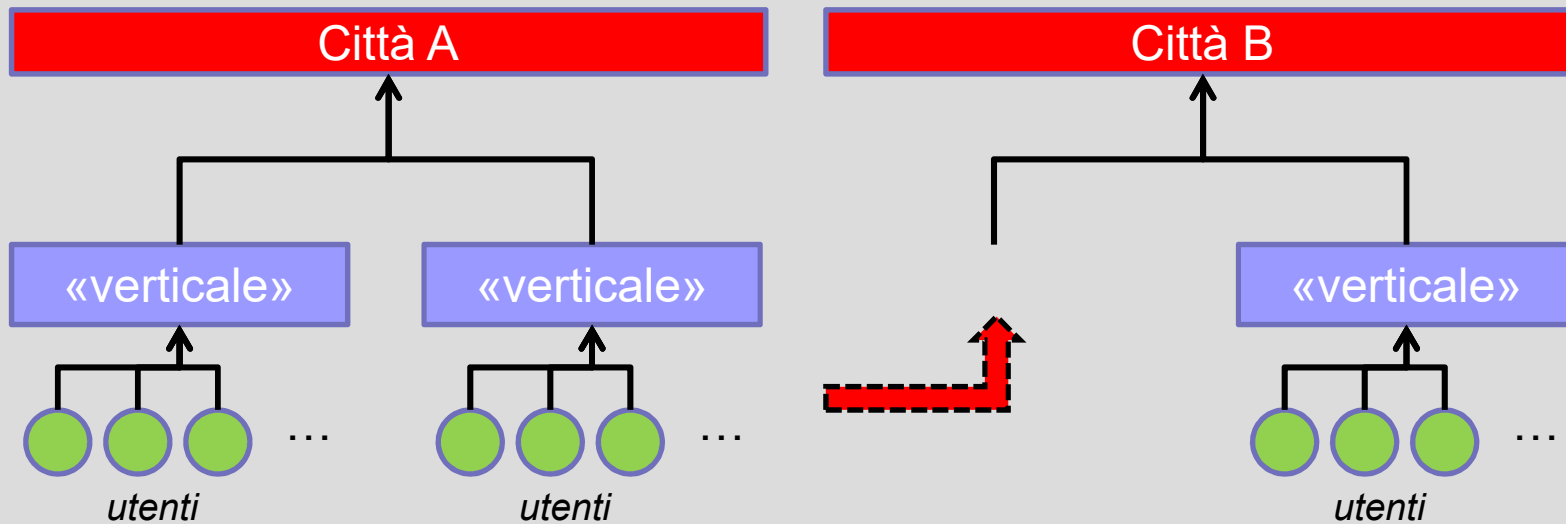
Smart

La piattaforma integrata ed aperta



- Condivisione architettura generale
- Piattaforma di integrazione standard
- Interfacce comunicazione standard
- Generazione e comunicazione di KPI pubblici

Modularità, Intercambiabilità, Riutilizzo



- Abbattimento dei costi
- Benchmarking
- Evitare il LOCK-IN

La convergenza sugli Standards

PIATTAFORMA APERTA -> STANDARDS !

Esistono degli standards creati appositamente per lo sviluppo delle smart cities
Convergenza internazionale ed europea.

-> occorre creare una convergenza italiana !

IES Cities Framework

Goal: A reference framework for the development of architectures for incremental and composable Smart Cities



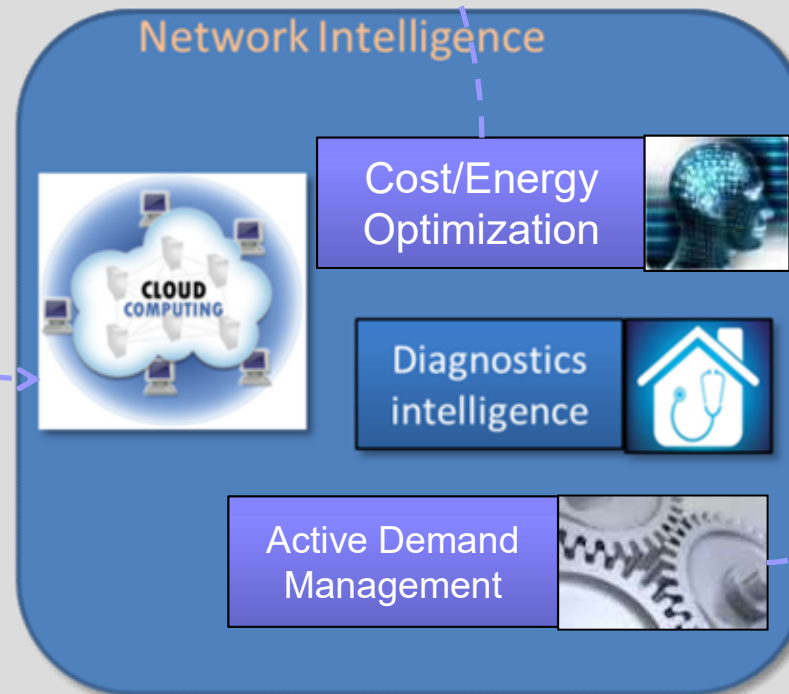


The Smart Building Network



REMOTE
MONITORING

MANAGEMENT
OPTIMIZATION

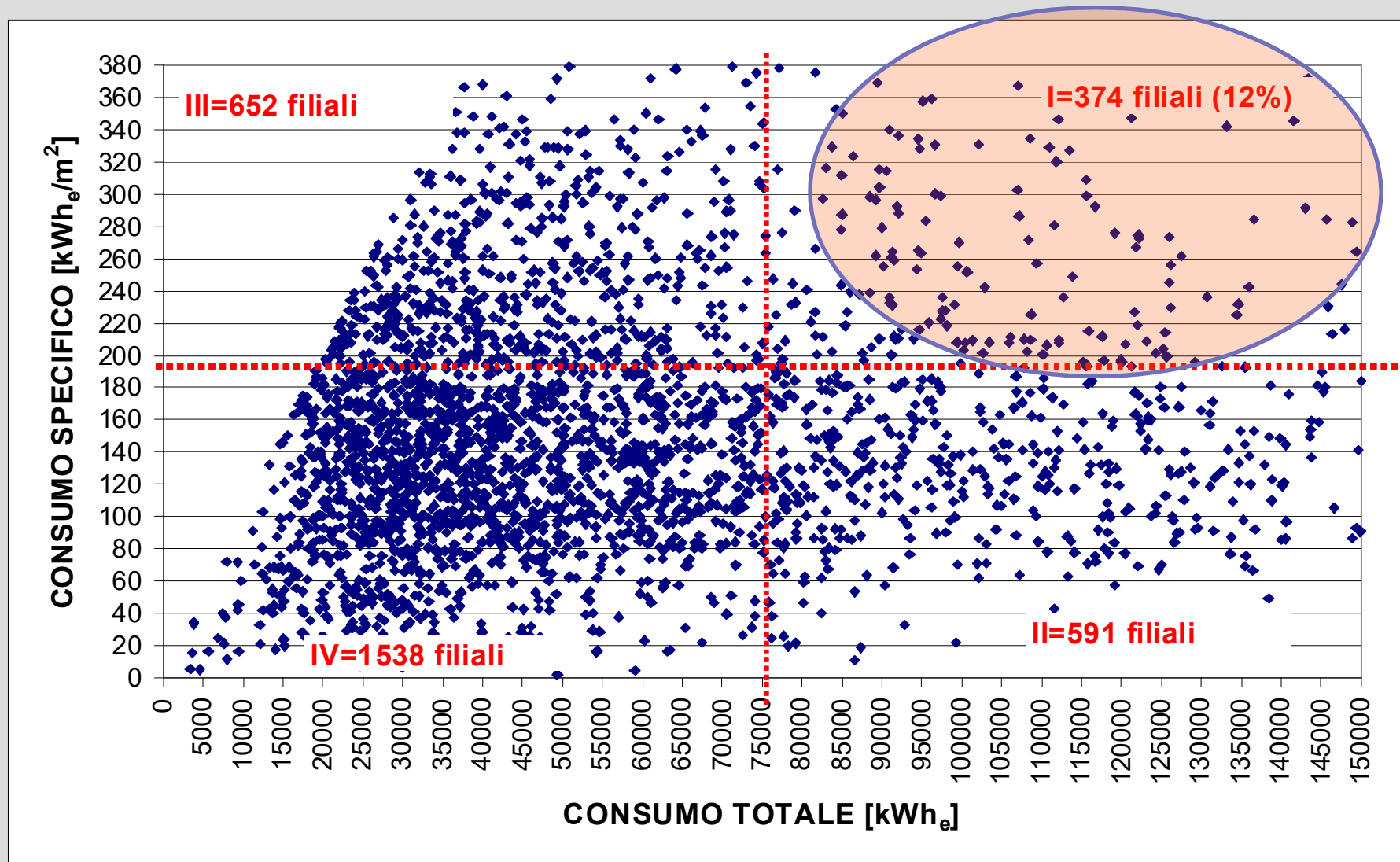


NETWORK
SUPERVISORS

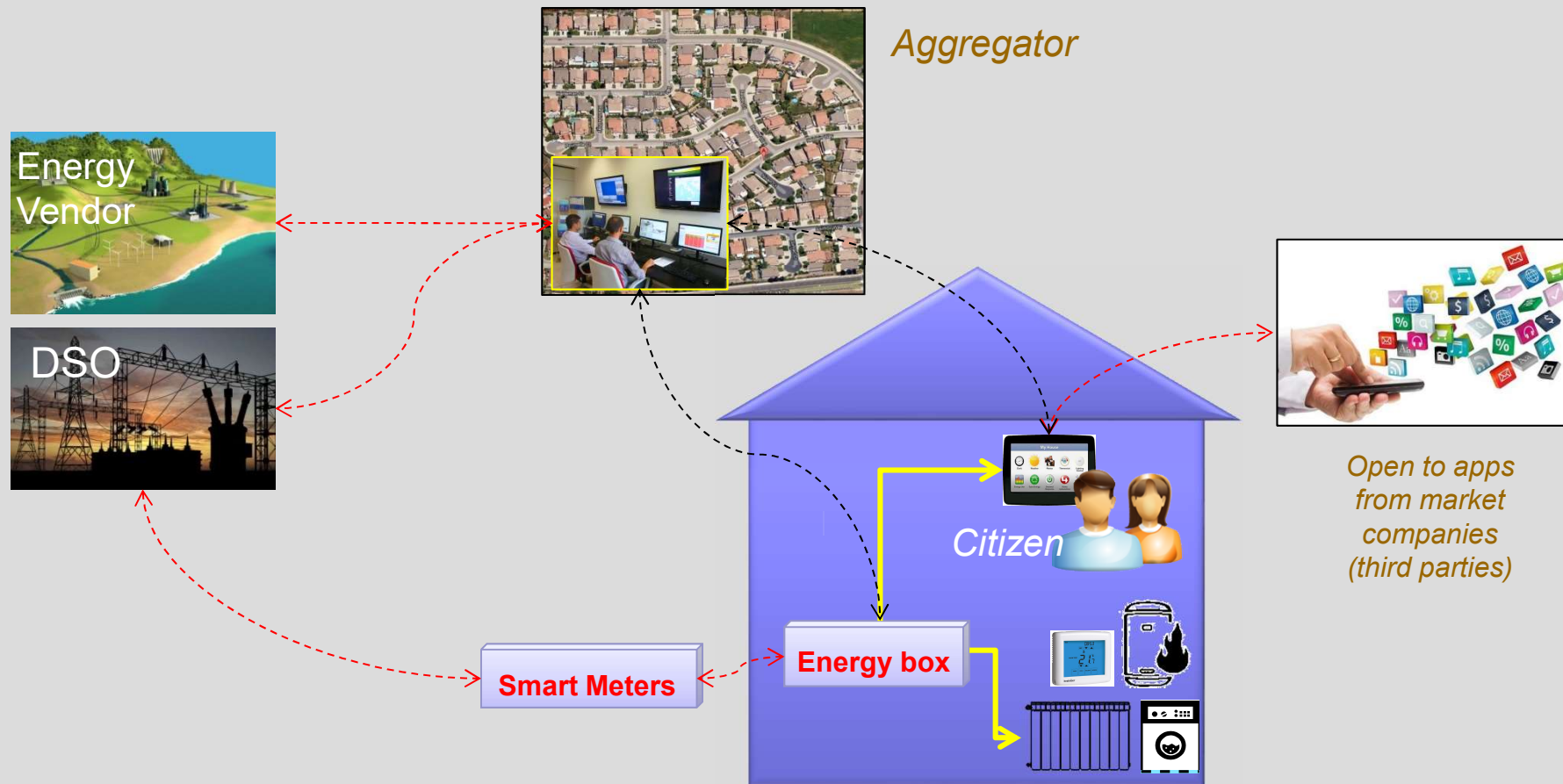


GRID
DISTRIBUTOR

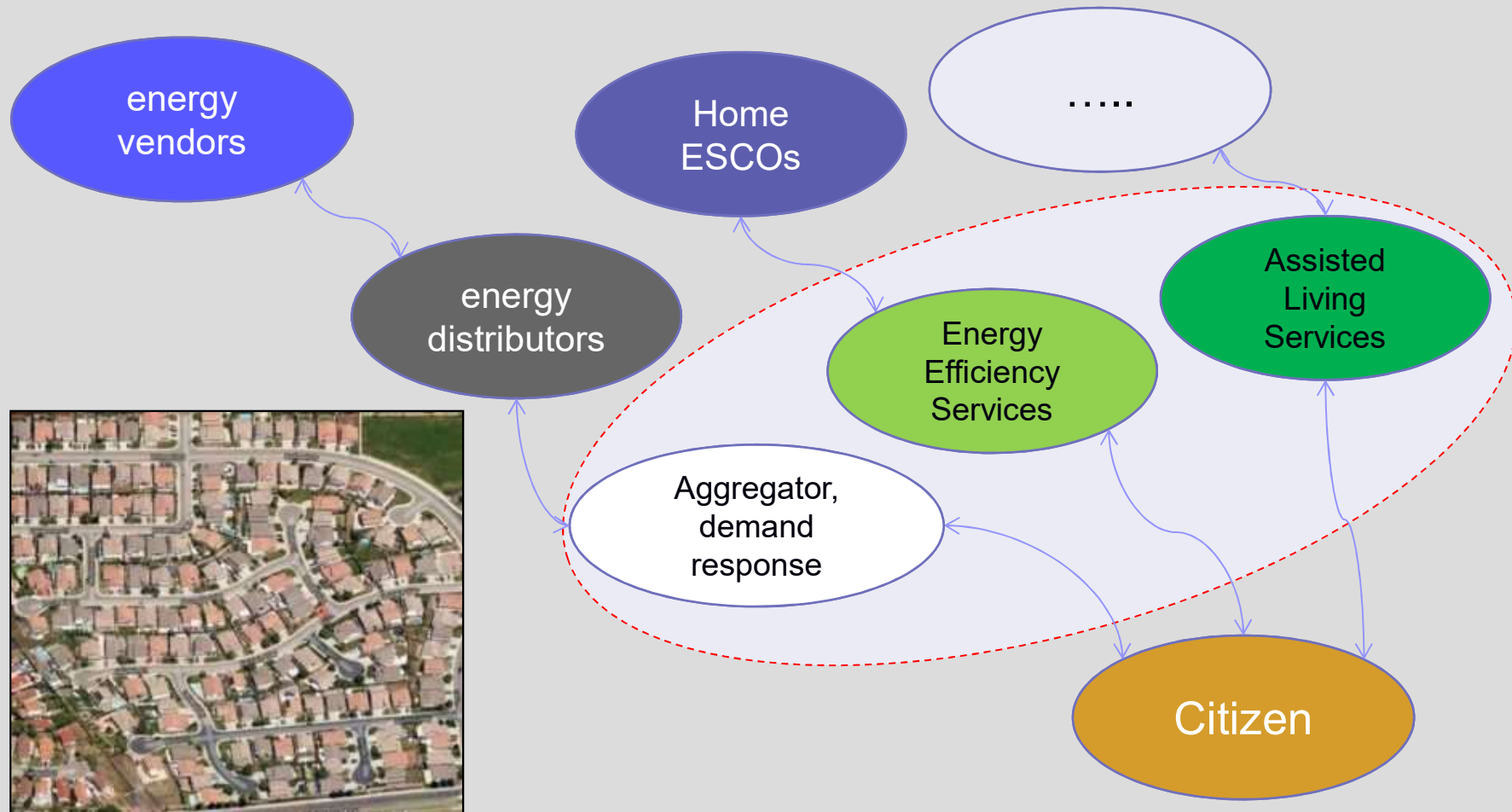
Building Asset Management



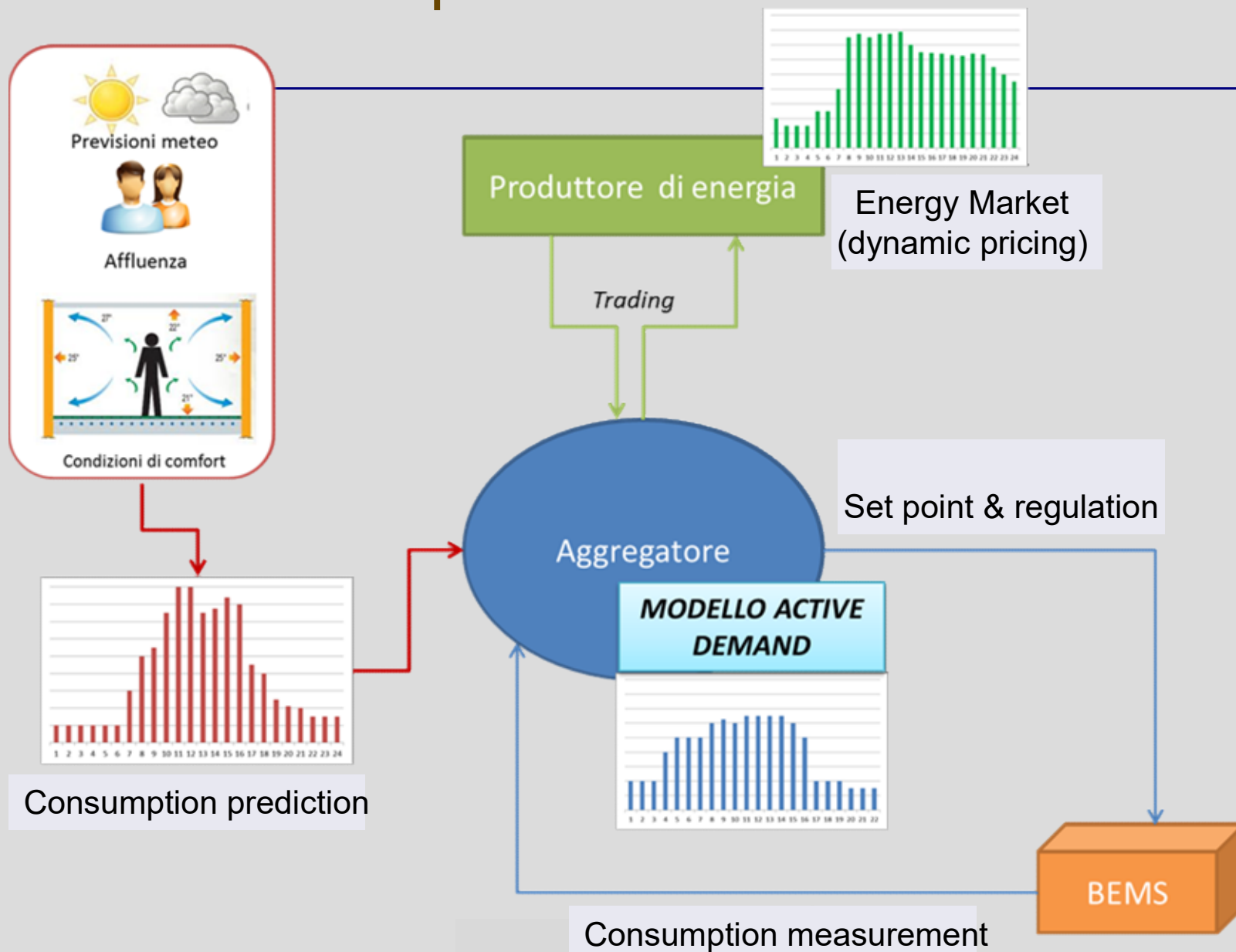
Connettere il mondo delle smart grids con il dominio delle smart homes per aprire nuovi mercati



New market actors: aggregators & citizen services



The «Demand Response» mechanism

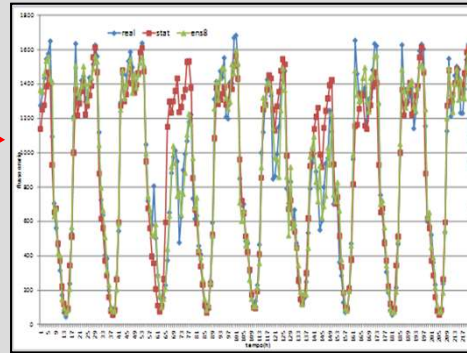


SMART Lighting

TRAFFIC AND PEOPLE
MONITORING



MODELLING &
HOURLY PREDICTION



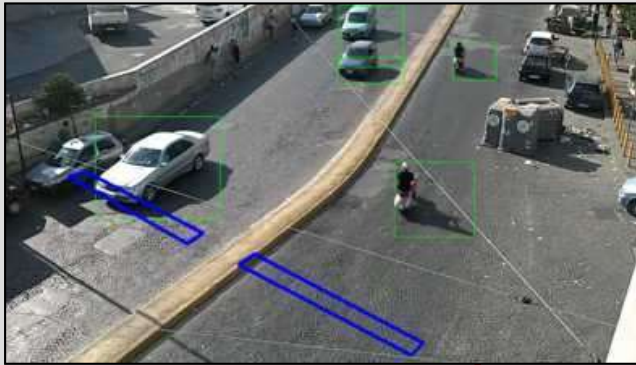
LIGHT CONTROL
- ENERGY ON DEMAND -



SMART
POLES



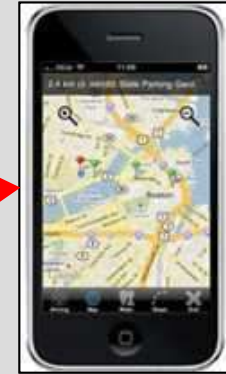
SMART SERVICES – SMART STREET



TRAFFIC/PEOPLE/SAFETY MONITORING



CITY CONTROL ROOM



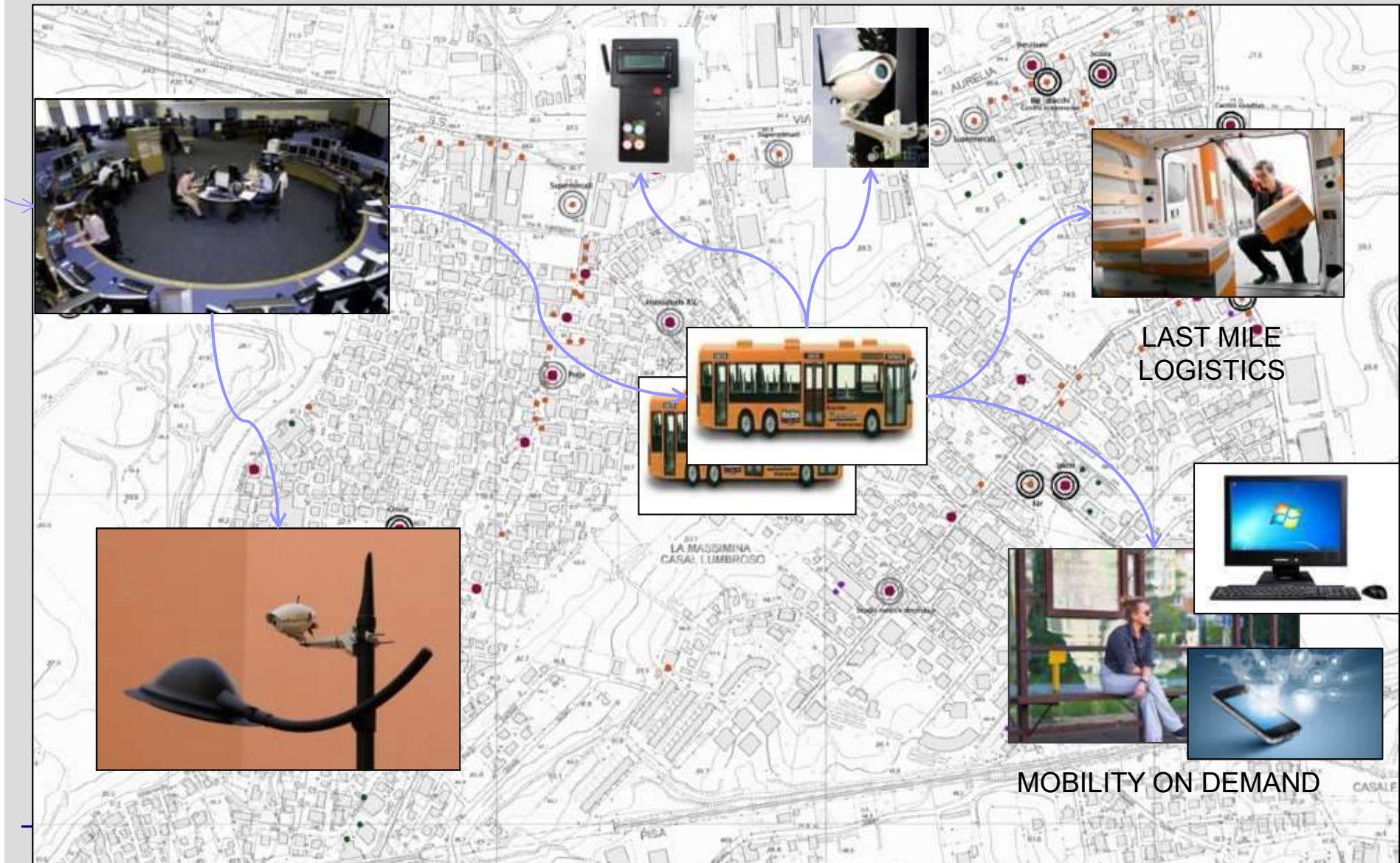
INFOMOBILITY, AIR QUALITY



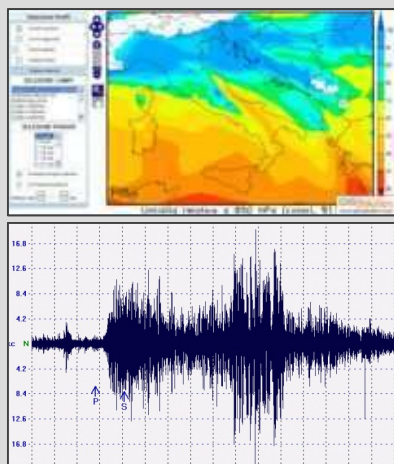
SMART PUBLIC BUSES AS A - CITY MOBILE SENSOR
NETWORK -



Smart Local Transport Services on Demand



Urban Security Framework



Nowcasting



Scenario Evolution



Utilities Early Warning



Damage Monitoring



Black out



Flooding



T-Jam
Thin Dust



Extreme Wind



Snow



Earthquake



Com B-out



*Grazie per
l'attenzione!*



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