Le bâtiment intelligent

The team

Founders : the core team of Netcentrex, a leading next-generation networks application vendor sold to Comverse, inc in 2006

Olivier Hersent (CEO):

- CTO of Comverse, inc (2006-2008)
- founder of NetCentrex (1998-2006)
- R&D France Telecom

Team track record :

- World's first 3Play at Fastweb
- Over 8 million 'livebox' deployed (>8000/day),
- World largest voice VPN (Equant)
- Over 80 operators in 30 countries

actility

Active Utility : Rupture technologique

Objets intelligents

Les objets deviennent connectés (GPS, véhicules, appareils dédiés…)

Dérégulation de l'énergie

L'innovation nécessite une présence active chez le client (compteurs intelligents, gestion de la demande)

Communications M2M à grande échelle

Gestion active d'objets
De 100.000 à 100 M d'unités

Véhicules électriques

Nécessitent une gestion active du réseau de distribution

Energies renouvelables

Nécessitent une gestion active de la production

actility

3

Solution overview

Smart Grid & EV

Smart Building

3rd Party applications

- Application layer

ThingPark Store®

- SDK “Internet" REST
- Publication
- Déploiement
- Facturation

ThingPark® infrastructure

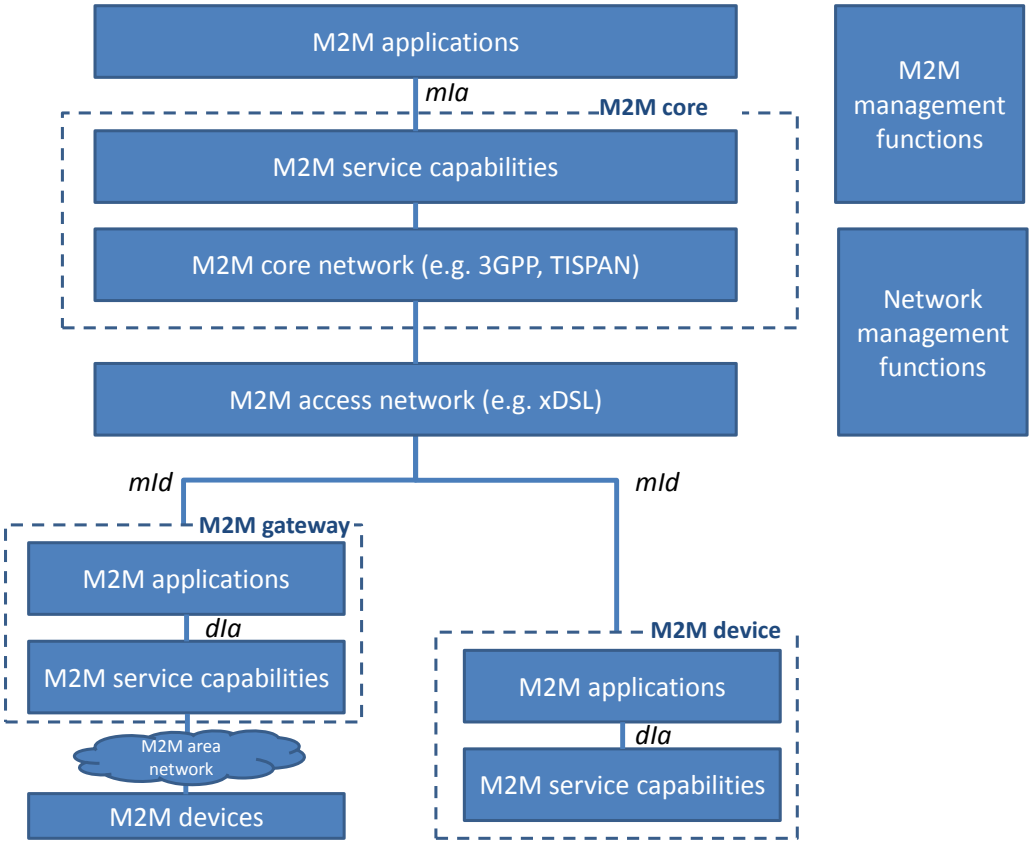
- 1ère solution M2M ETSI
- Normes IMS 3GPP
- Transport sécurisé
- Multi-protocole M2M (Zigbee, Zwave, LON, KNX…)

Multi M2M protocol

OUVERTURE DES PROTOCOLES GTB

Key features of ETSI M2M (1)

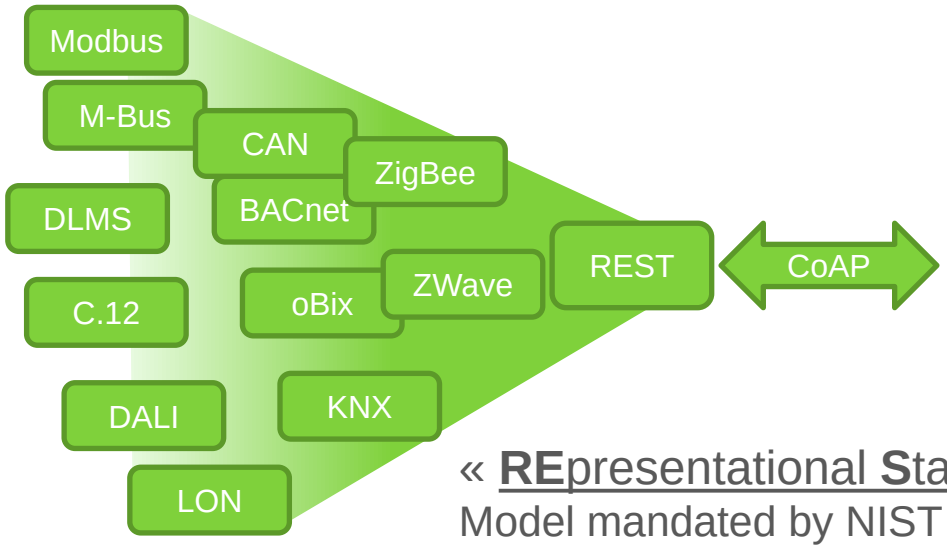
- Standardization of course (ETSI is an official SDO)
- Scalability and security : « telecom grade »



Key features of ETSI M2M (2)

First level of syntax standardization:

- REST : do everything with 4 verbs and ‘documents’
- Documents use XML and MIME types




```
<GET http
Application>
climatisation
<POST http…>
<PUT http…>
<DELETE http…>
…
```

« **RE**presentational **S**tate **T**ransfer »
Model mandated by NIST for future standard ‘smartgrid’ applications. REST may be carried by CoAP defined in IETF

Semantic level: Generic concepts

	ZigBee	BACnet	KNX	Zwave	DLMS/COSEM
Network	yes	yes	yes	yes	yes
Object	ZB node	BACnet device	KNX device	Zwave node	Cosem server
Object App.	endpoint	Not native use Structured view	No (just 1)	Device class	Logical device
Interface	cluster	Structured View	Functional block	Command class	Interface object
Basic elements (incl. Point)	Simple types	Objects	Datapoints	Types attributes	Attributes

Le modèle générique TR 102 966

- Chaque **technologie** gère des réseaux
- Chaque **réseau** contient des nœuds
- Chaque **nœud** contient des applications
- Chaque **application** contient des interfaces
- Chaque **interface** contient des **points**…

Concilier générique et natif…

```
<obj href="m2m:ApplicationDescriptor"
                                        xmlns="http://obix.org/ns/wsdl/1.1"

        xmlns:m2m="http://uri/etsi.org/m2m/obix">

        <str name="applicationID"/>

        <list name="Interfaces" of="obix:ref m2m:Interface"/>

</obj>
```

Generic semantic template

ZigBee specific derivation

```
<obj href="zigbee:AppDescriptor" is="m2m:ApplicationDescriptor"
                                        xmlns="http://obix.org/ns/wsdl/1.1"
                                        xmlns:m2m="http://uri/etsi.org/m2m/obix"

        xmlns:zigbee="http://uri/etsi.org/m2m/zigbee/obix">

        <str name="extendedPanID"/>        <!-- optional element -->
        <str name="ieeeAddress"/>          <!-- optional element -->
        <int name="endpoint"/>
 <int name="applicationProfileID"/>
 <int name="applicationDeviceID"/>
 <int name="applicationDeviceVersion"/>

 </obj>
```

ZigBee cluster as seen by M2M application : it's a document !

```
...
<int name="endpoint" val="1"/>
<int name="applicationProfileID" val="0x0104"/>
<int name="applicationDeviceID" val="0x0100"/>

<list name="Interfaces">
        <obj>
                <str name="clusterID" val="0x0006"/>
                <enum name="clusterType" val="input"/>

                <list name="attributes">
                        <ref name="0x0000“ href="/<sclBase>/app/containers/0x0006_OnOff"/>
                </list>

                <list name="operations">
                        <op name="0x00" href="/<sclBase>/applications/<IPU>/0x0006_off"/>
                        <op name="0x01" href="/<sclBase>/applications/<IPU>/0x0006_on"/>
                        <op name="0x02" href="/<sclBase>/applications/<IPU>/0x0006_toggle"/>
                </list>
        </obj>
</list>
...
```

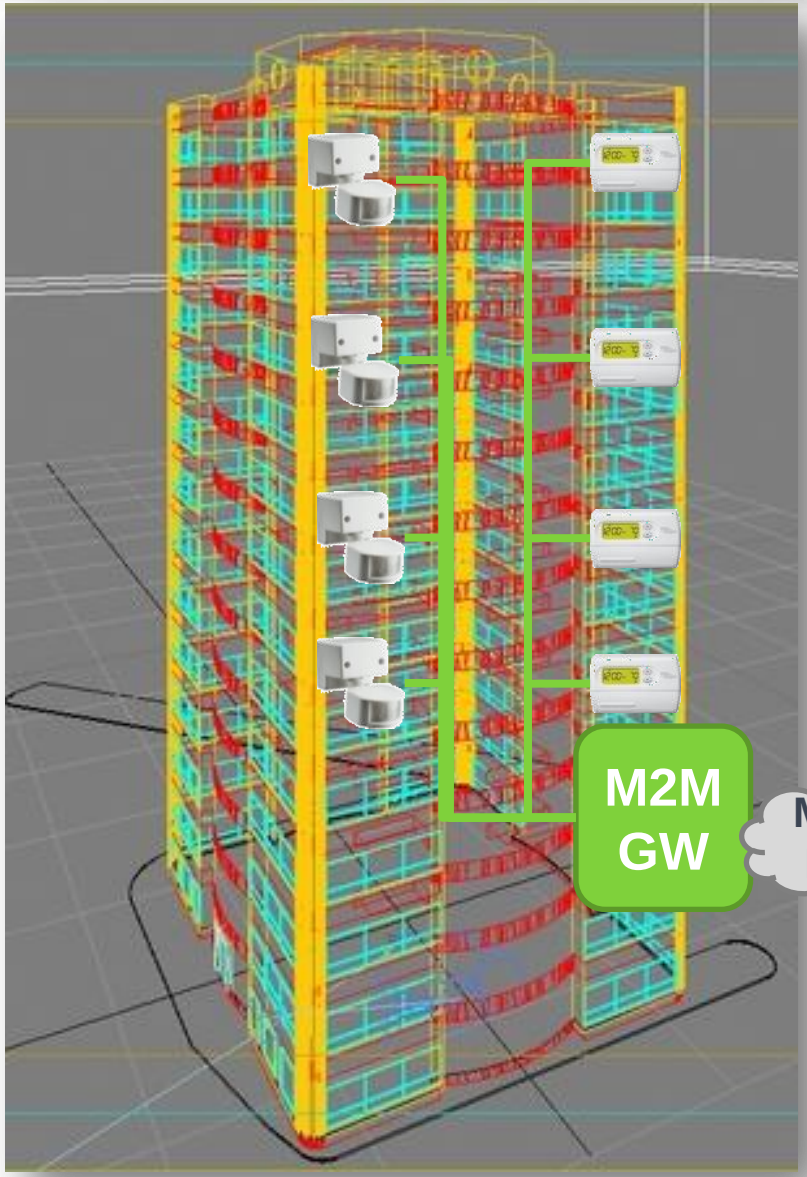
Actility delivery

- Open source implementation (GW, AS)
- Automated testing tools

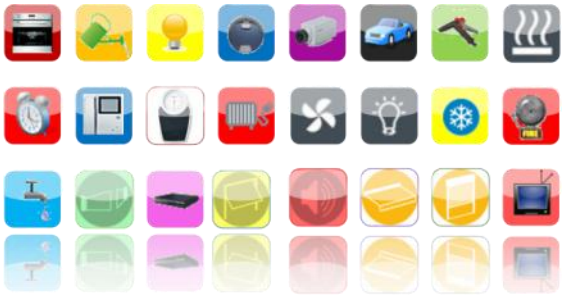
  http:// open.actility.com

SERVICE ENABLED BUILDING

Service Enabled Buildings ®



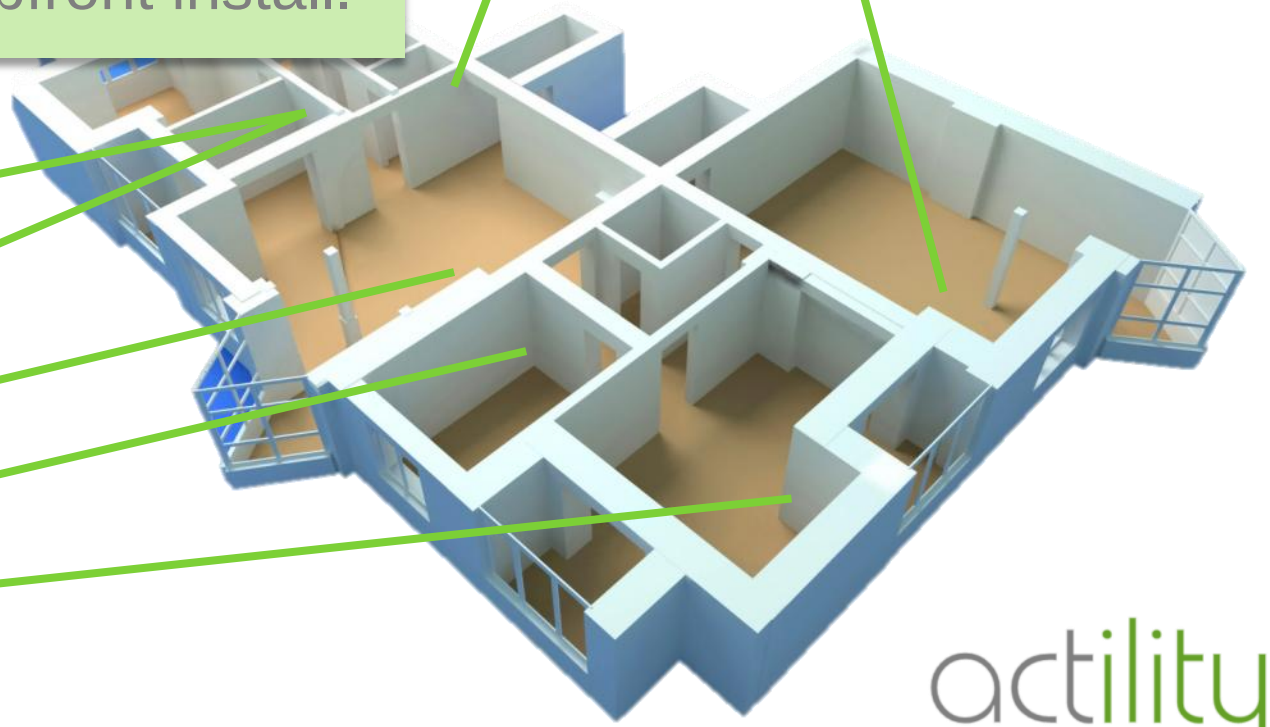
- Building pre-equipped with sensors/actuators in both public and private area
- Access to active devices is enabled via ThingPark®



actility

SEB® : Which active devices?

The best candidates are devices which can be used to provide value added services, and which require high retrofit installation costs compared to upfront install.



actility

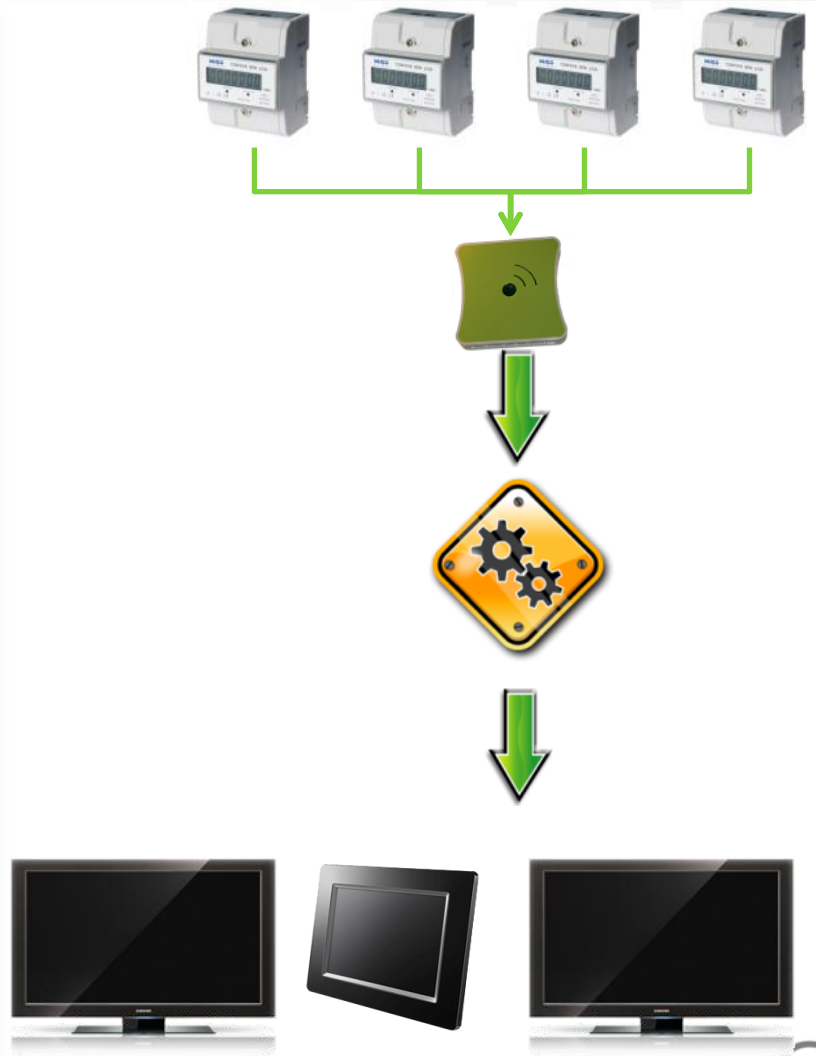
EXEMPLE D'APPLICATION EPA

EPA® : Power consumption digital signage

Collect

Analyse

Informe



Exemple applicatif : Smart-EPA®
Pour mesurer et informer

EPA: Interface de gestion d'affichage

EXEMPLE D'APPLICATION MTI

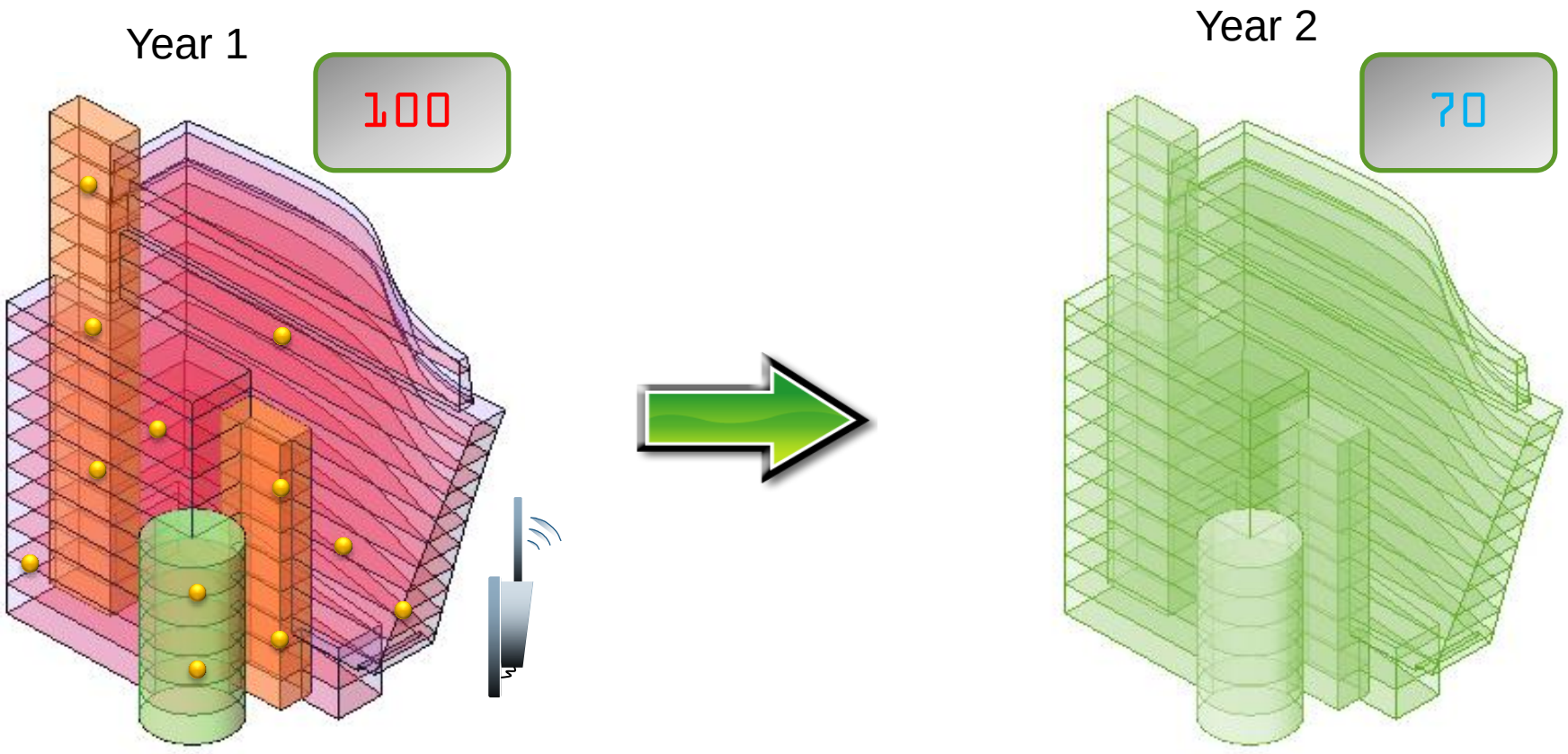
Modélisation thermique inverse

- Le pilotage des bâtiments est un **axe prioritaire** pour Actility
- Le calcul des propriétés thermiques est identifié comme un verrou technologique
- Travail entamé avec **LCPC** et **CSTB** pour industrialiser une modélisation thermique inverse automatique, servant aussi au pilotage optimisé des points de consigne.

→ Application dérivée au CPE : « photo » des propriétés thermiques dans le cadre de **IP-MVP**.

Smart-EPC® Energy Performance Control

- **EPC / CPE** (inverse thermal modeling)

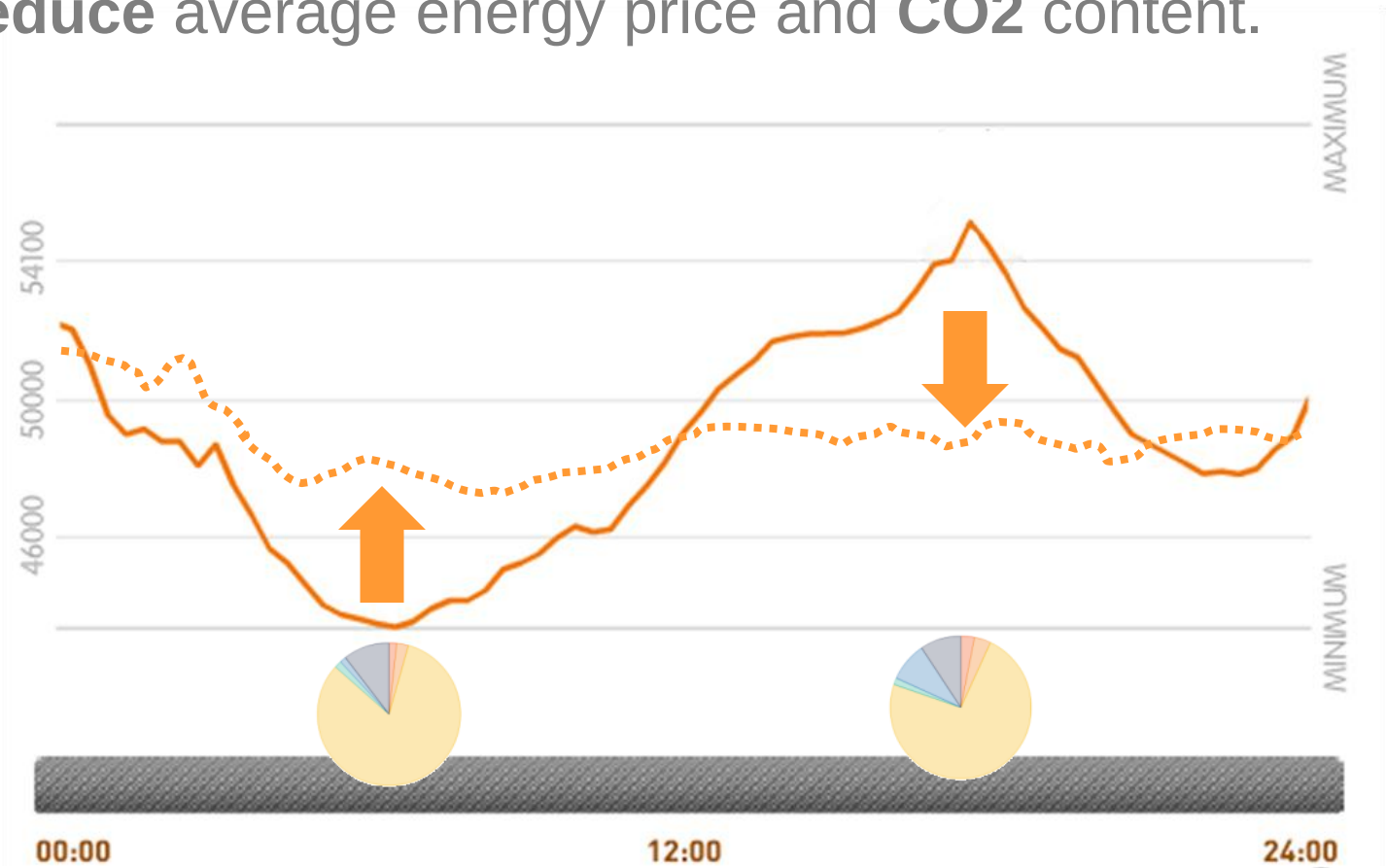


Smart-EPC as trusted third party

EXEMPLE D'APPLICATION SMARTGRID

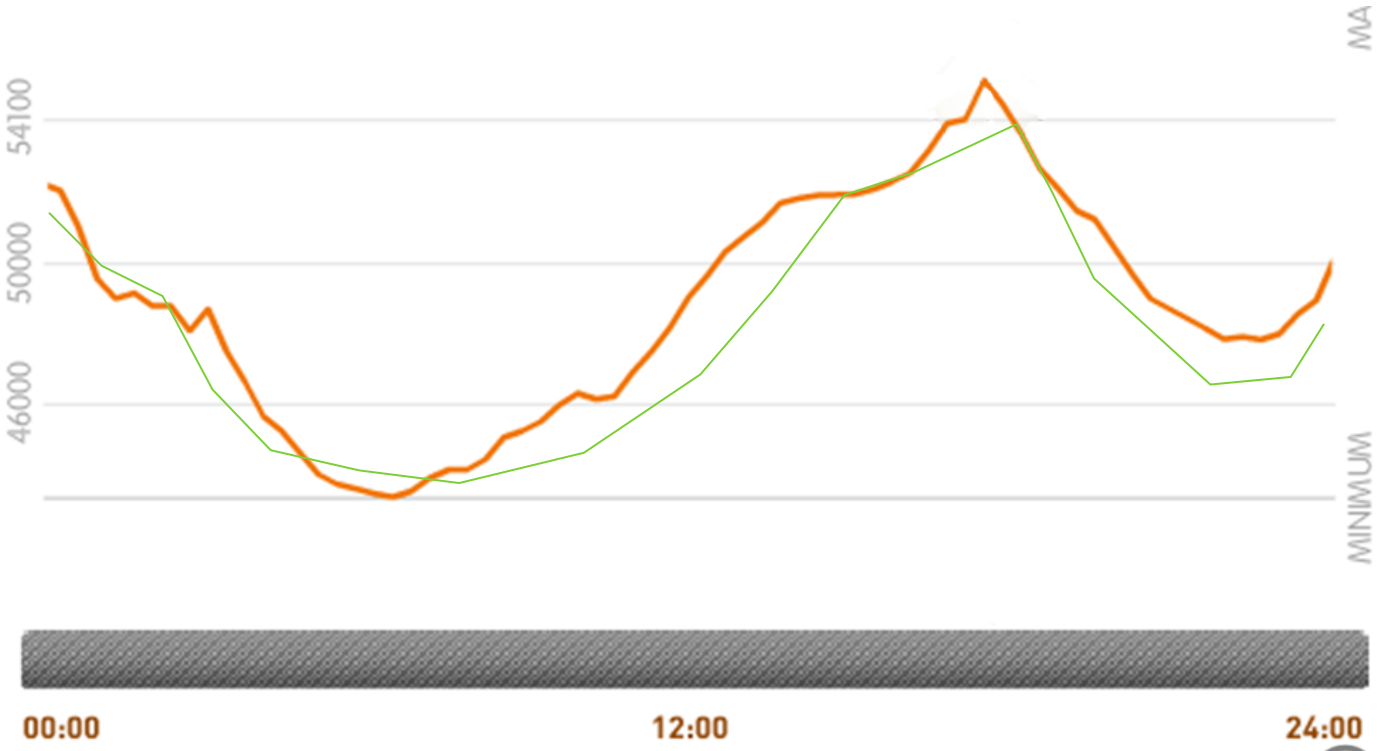
Smart-LS® - Load Shifting

- **Shift** demand from **peak** hours to **off**-peak hours of the day
- **Reduce** average energy price and **CO2** content.



Smart-DR® - Adjustment

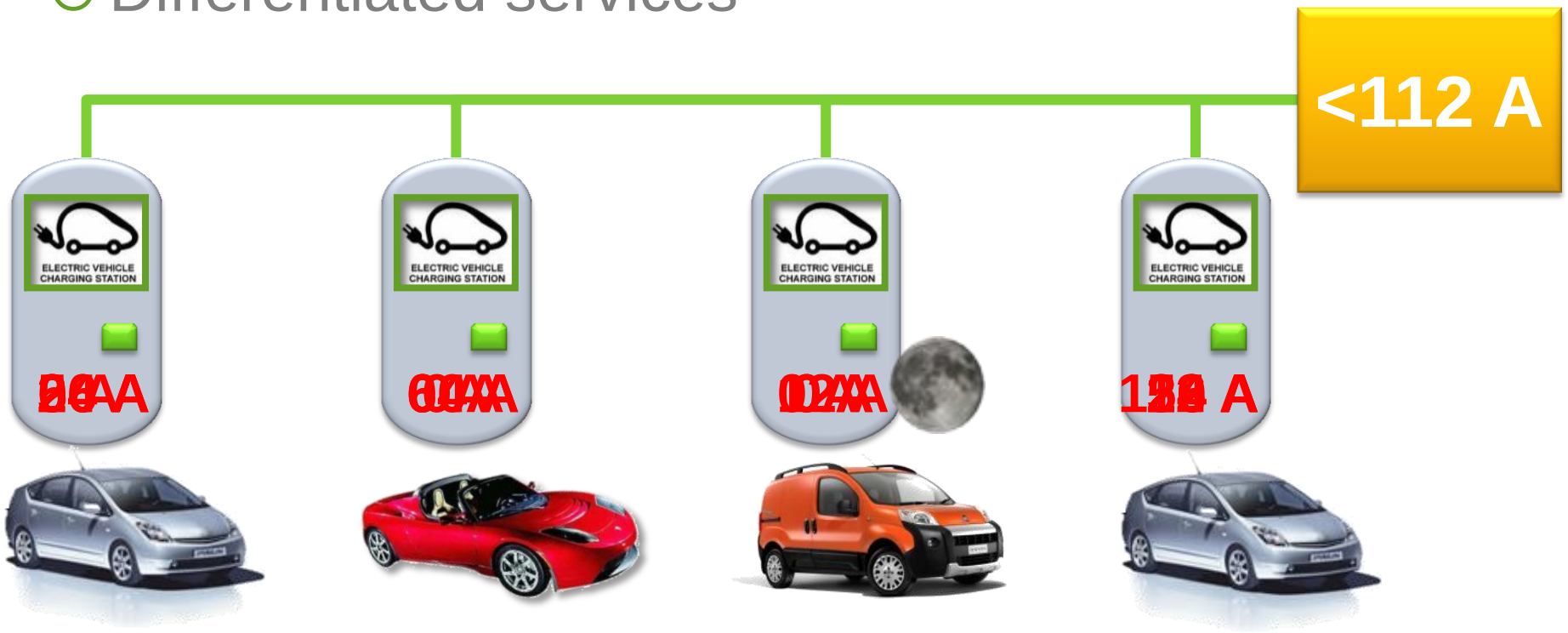
- TSOs need to ensure production = consumption at any time
- Consumption flexibility can be turned into revenues and avoids starting Gas/Fuel power plants



EXEMPLE D'APPLICATION SMART EV

EV® - Charging network management

- Authentication and Admission control
- Differentiated services



Penser l'interface GTB / Applicatif

- Même relation qu'entre un AIRBUS et son pilote
- La GTB est la garante du « domaine de vol » du bâtiment (respect de contraintes élémentaires, sécurité, autonomie).
- Les applications externes apportent une gestion plus fine du bâtiment, sous le contrôle de la GTB.

→ c'est une nouvelle génération de GTB

Eclairage

Regulation

Zigbee

6lowPan

Mesh

Senseur

Le bâtiment se transforme en plateforme technologique complexe

Véhicule électriques

Réseau

Photovoltaique

IP

Climatisation

EnR

Smart Grid

… qui sera gérée par de multiples applications

ThingPark®