

Environmental and efficiency indicators in urban water supply systems

Experiences from international cooperation
and large utility operation

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- Public corporation, owned 100% by the government of the Madrid Region. Created in July 2012, derived from Canal de Isabel II, the water services provider for the region since 1.851.
- Provides drinking and wastewater services to 6.48M people in 179 municipalities.



INDICATORS for what?

- Just for measure
- Performance assessment
- Reach a Certification
- Benchmarking
- Get a rating
- To improve – to manage—to make decisions
- ¡¡ TO UNDERSTAND !!

Improvement

Efficiency

- Economic
- Social
- Environmental

Sustainability

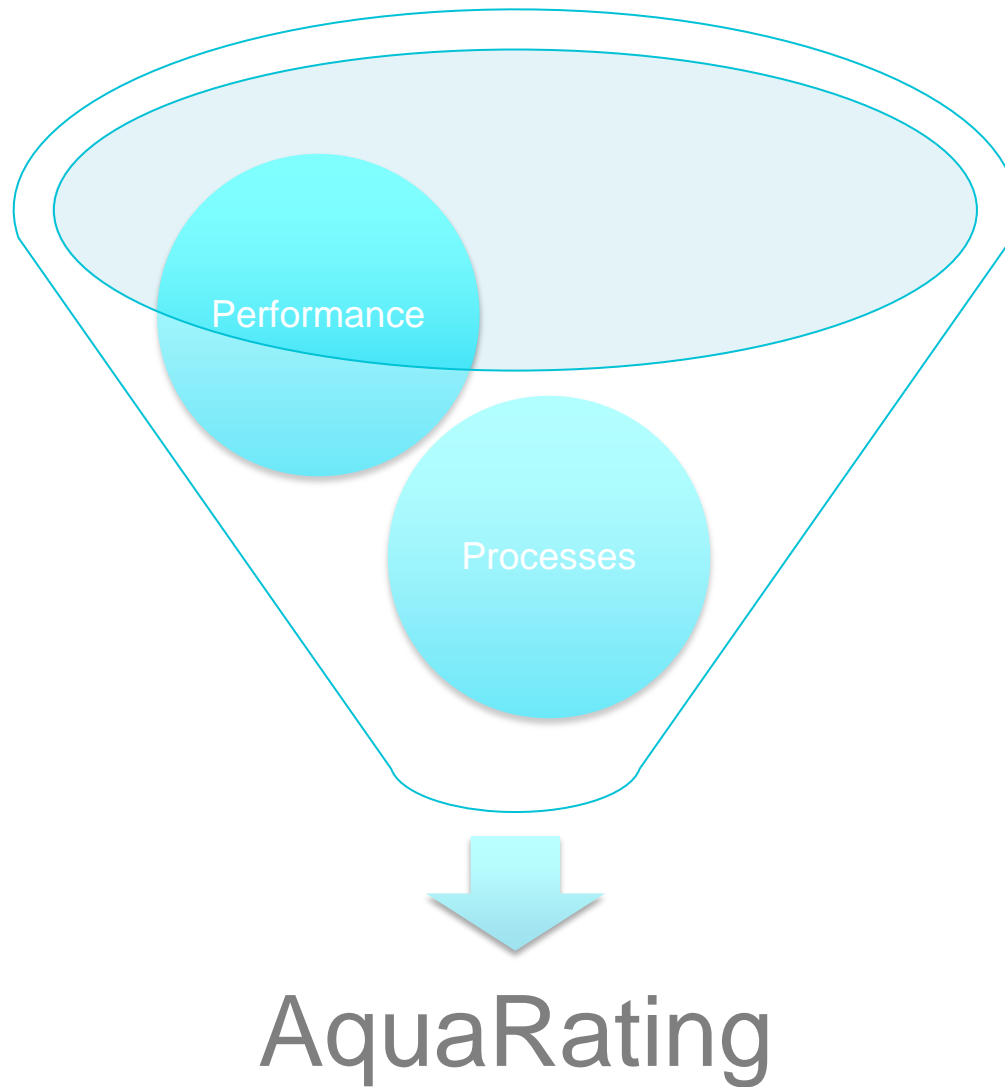
What kind of Indicators?

Quantitatives based on functions and variables

Qualitatives based on practices and procedures

Assessment Elements

AQUARATING



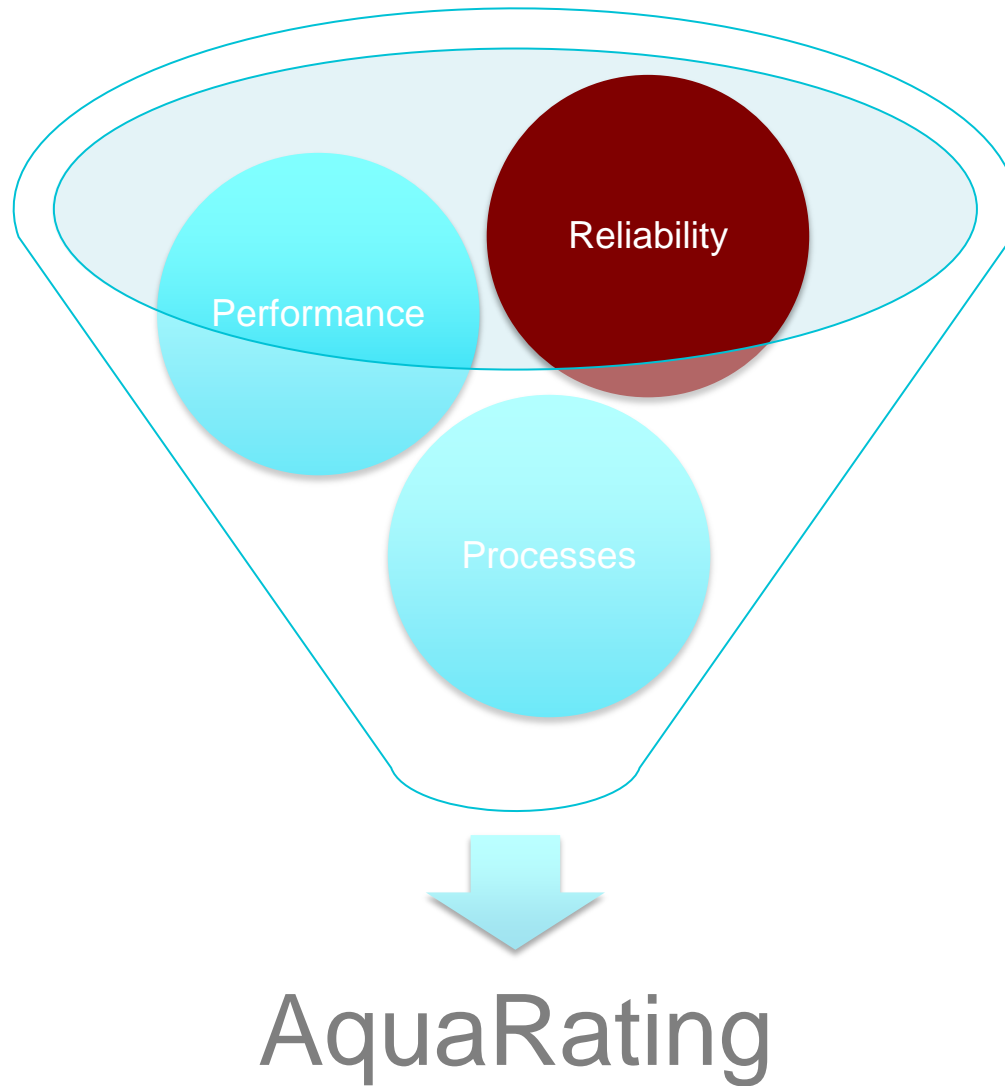
Assessment Structure

8 Áreas

27 Sub-áreas

113 Elements

- 62 Indicators
 - ✓ 99 Variables
- 52 Groups of prácticas
 - ✓ 348 Individual practices



Reliability

- To trust in assessment elements is a must
- Confidence level is a fundamental attribute
- For some usues, It could be a correction factor.

Risk Assessment and water services

Safety

Risk

Failure

Measuring failures

Assessing risks

Making decisions for safety (preferred, achievable, economic)

Based on risk (environmental, technical, economic, financial)

Approaches to Assessment

- Environmental
 - Economic
 - Social
-
- *Water Losses (Resources-Environment)*
 - *Non Revenue Water (Economic)*
 - *Service Discontinuity (social, compliance)*

Environmental Sustainability Assessment

Aquarating

Environmental Management Framework

Environment and Planning

WWTP Operation

Abstracted water vs. Natural availability

Energy consumption balance

CO2 emissions

Sludge Environmental Management

Use of Water Resources

Headroom of waste water treatment capacity

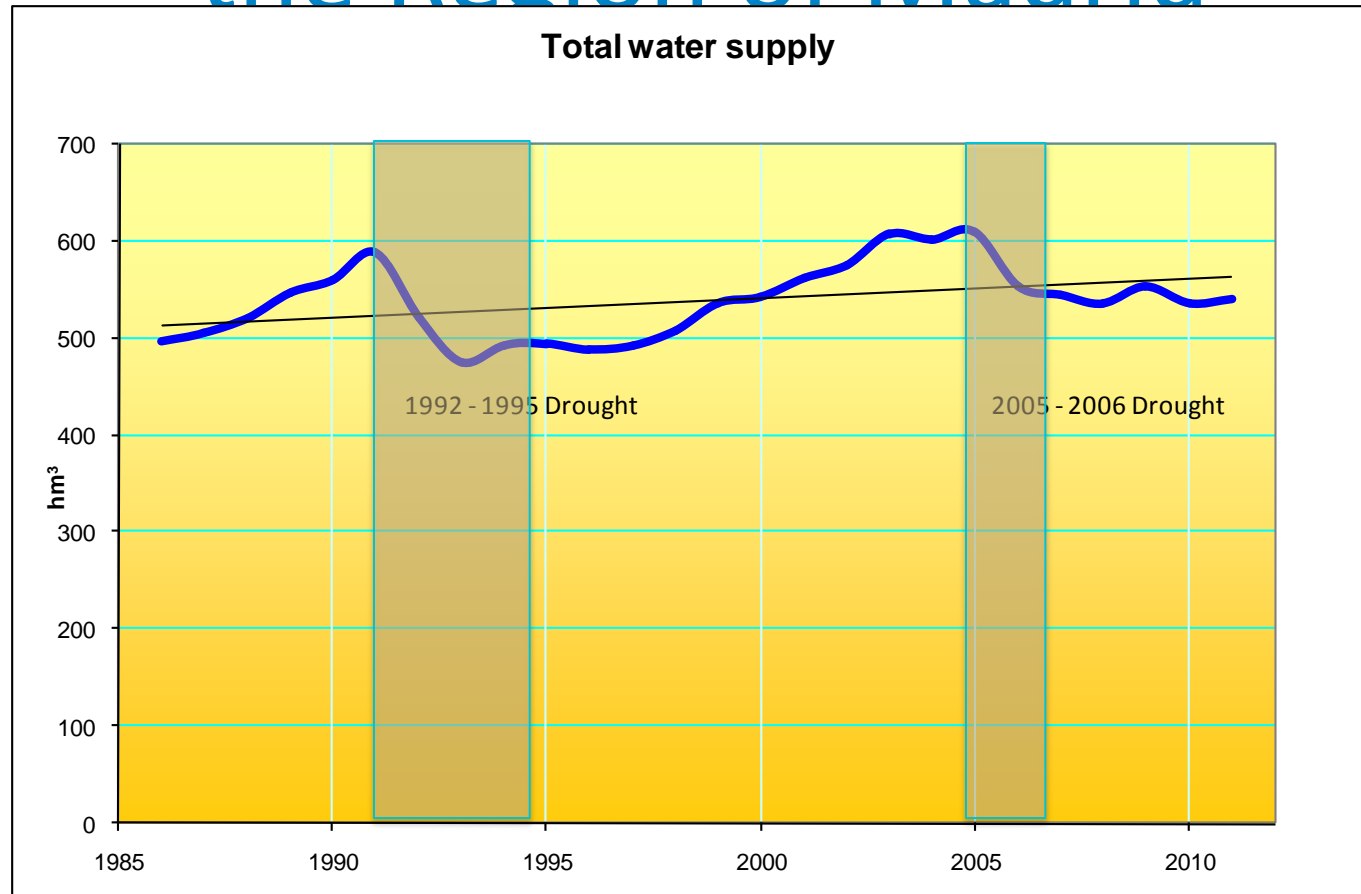
Compliance of wastewater

Compliance of environmental norms

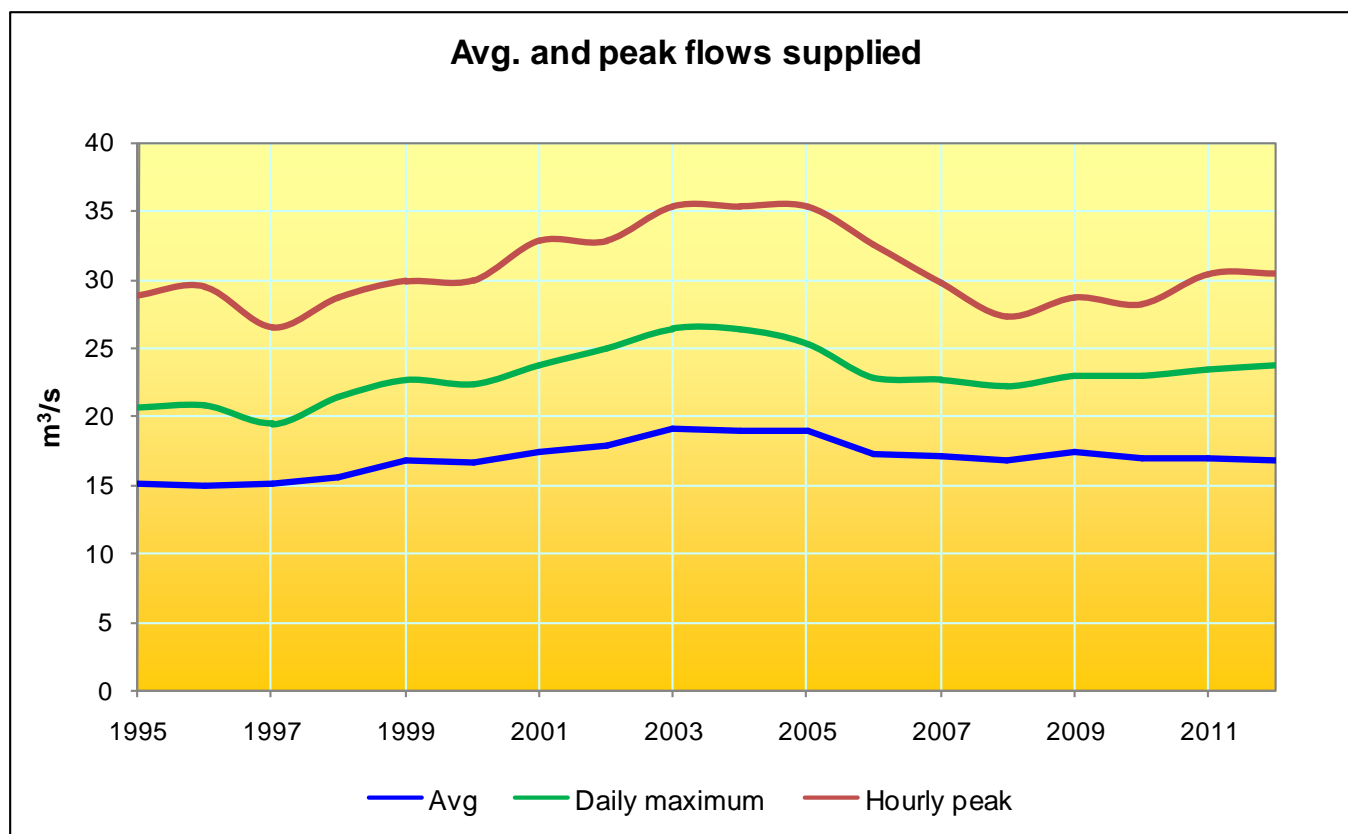
CONCLUSIONS

- There are no multipurpose indicators. Use only those appropriated
- Reliability of used information is crucial
- Best practices assessment is a must and it is feasible.
- There is a gap of Improvement of “smartness” of Assessment elements to understand better
- Facing efficiency and sustainability requires integrated indicators.
- Risk is an unavoidable parameter to reach efficiency and sustainability

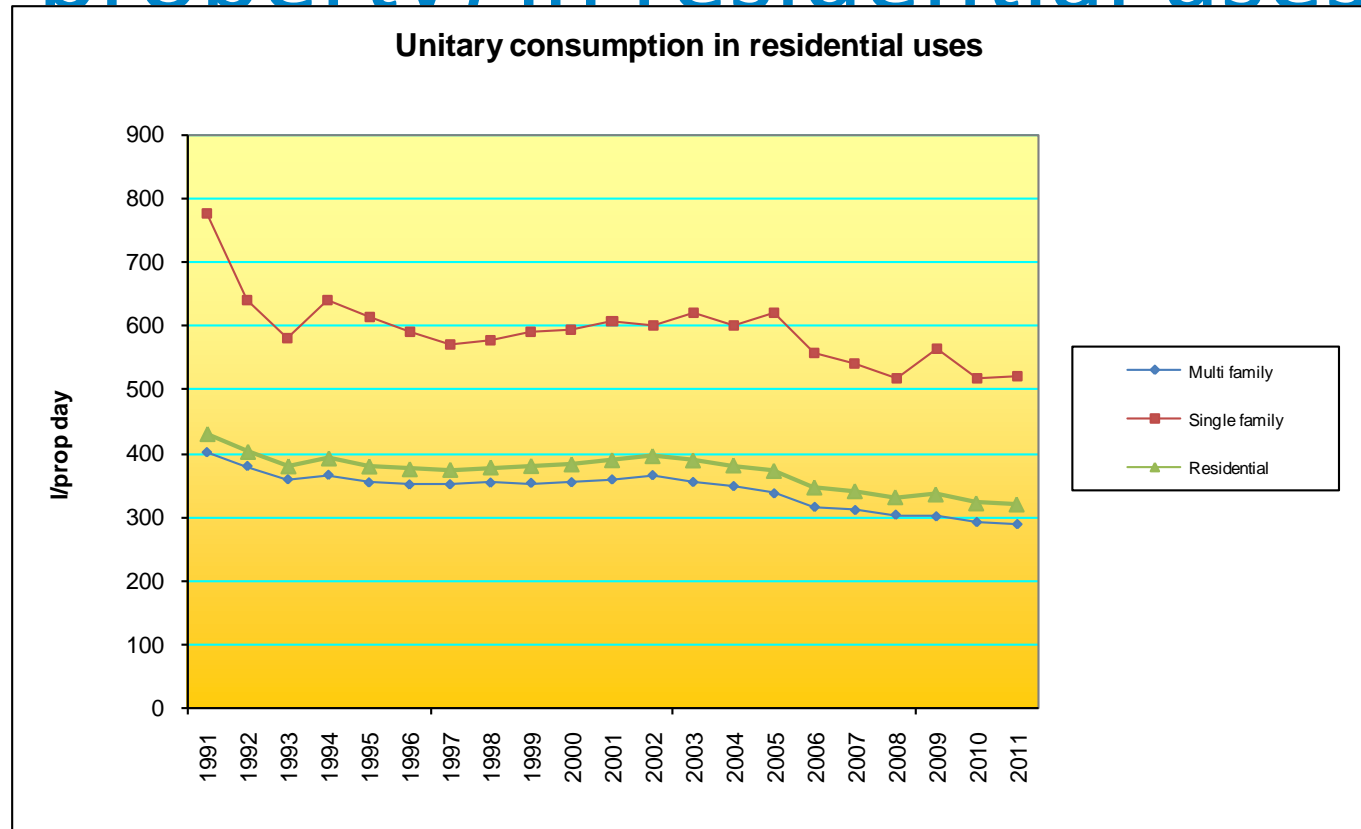
Total yearly water supply for the Region of Madrid



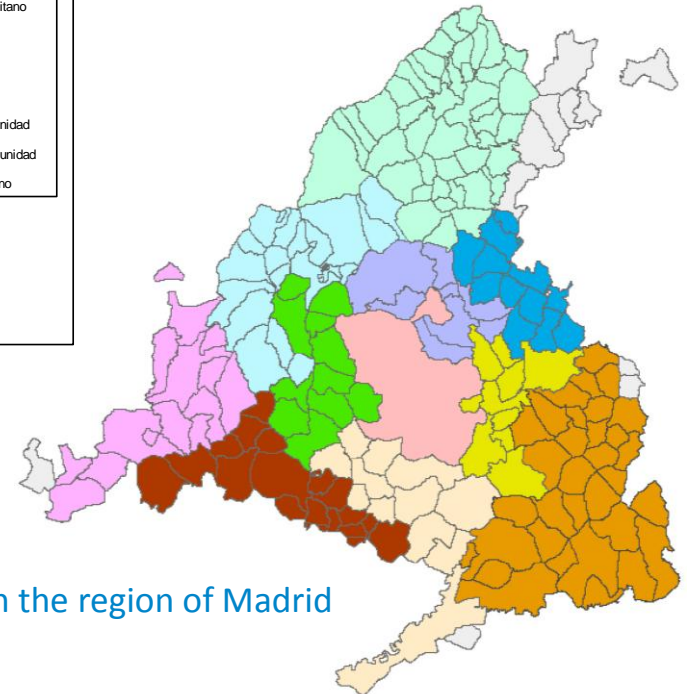
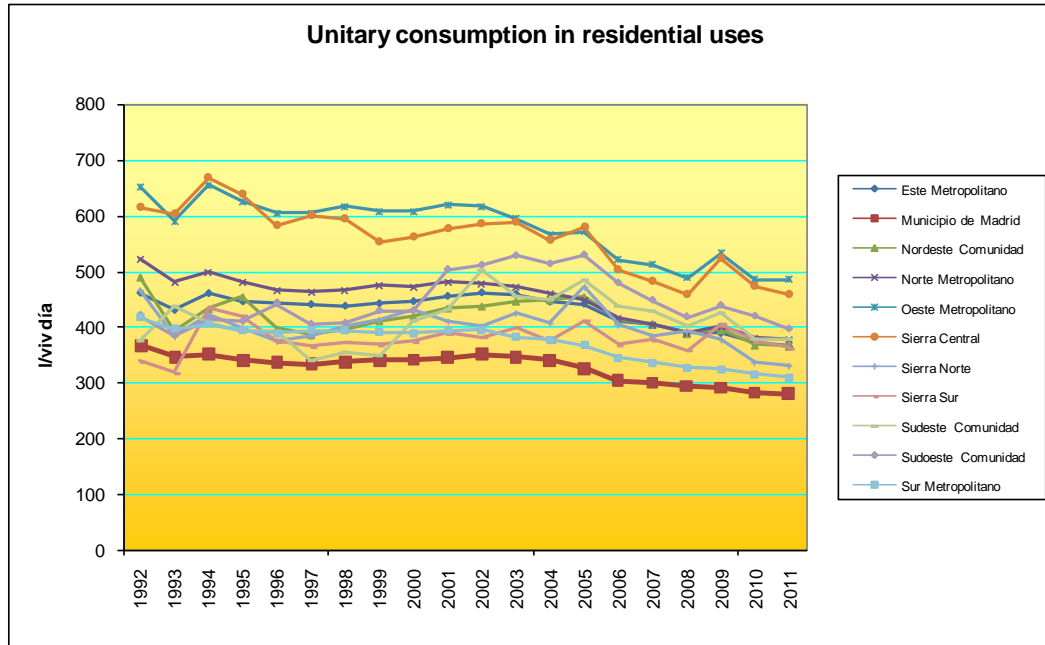
Total water supply for the Region of Madrid: average and peak flows



Unitary consumption (per property) in residential uses

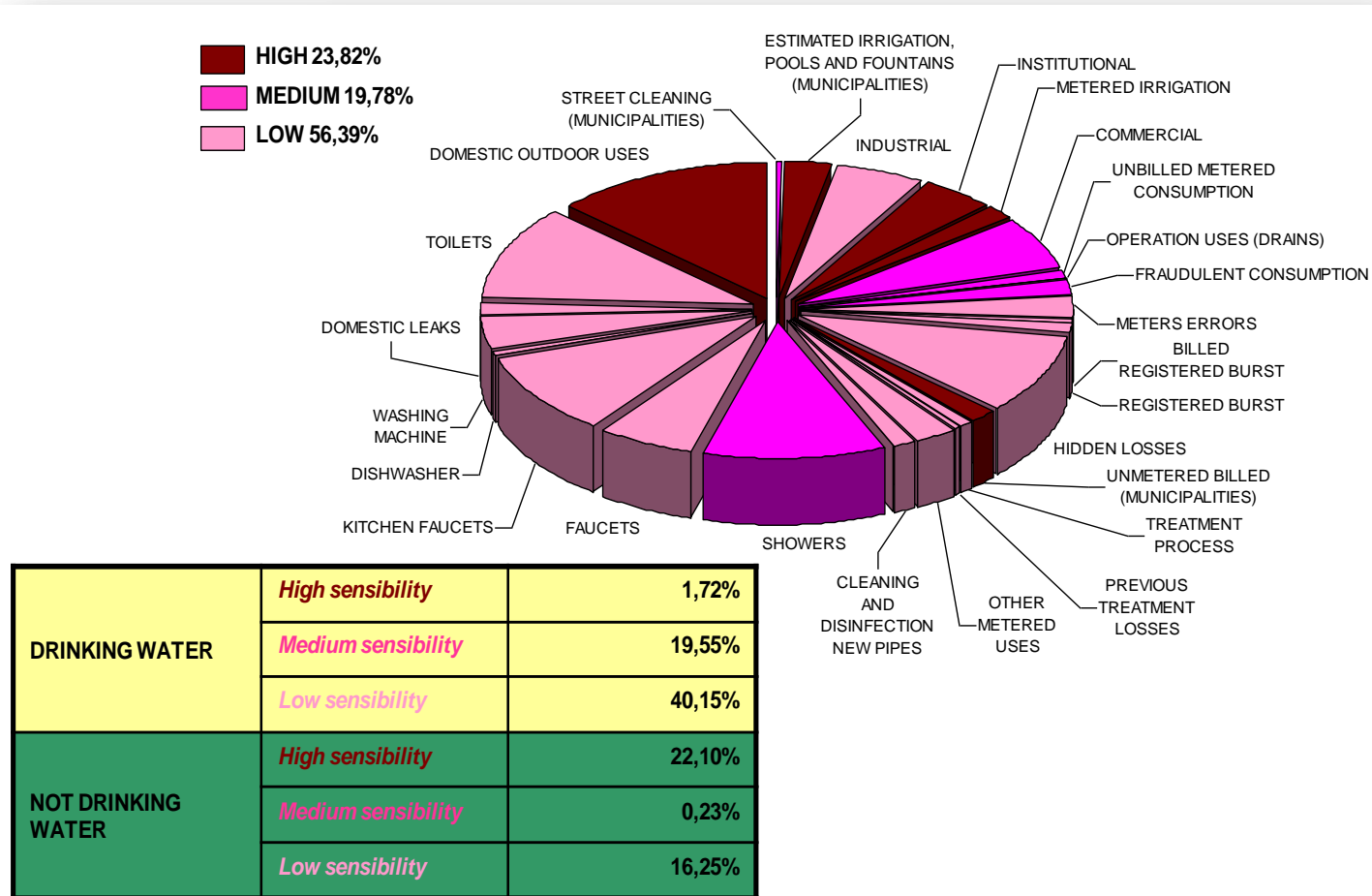


Significant differences in unitary residential consumption per areas

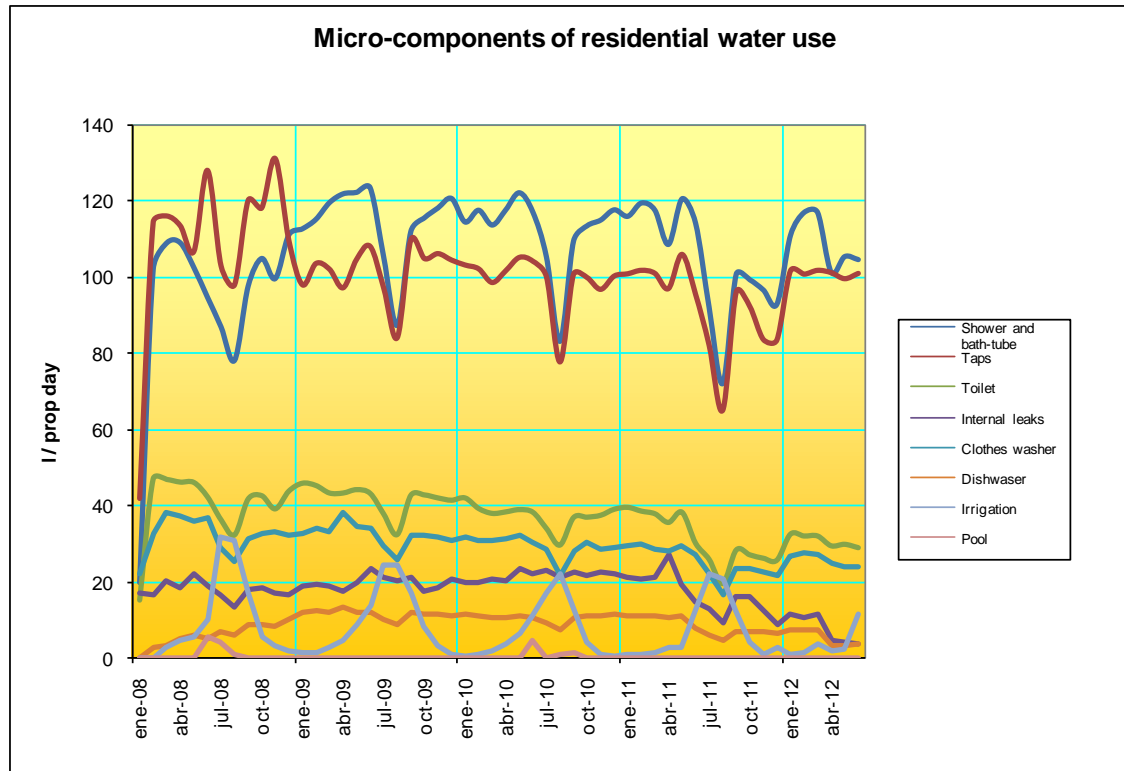


Statistical areas in the region of Madrid

END USES CLIMATE SENSIBILITY

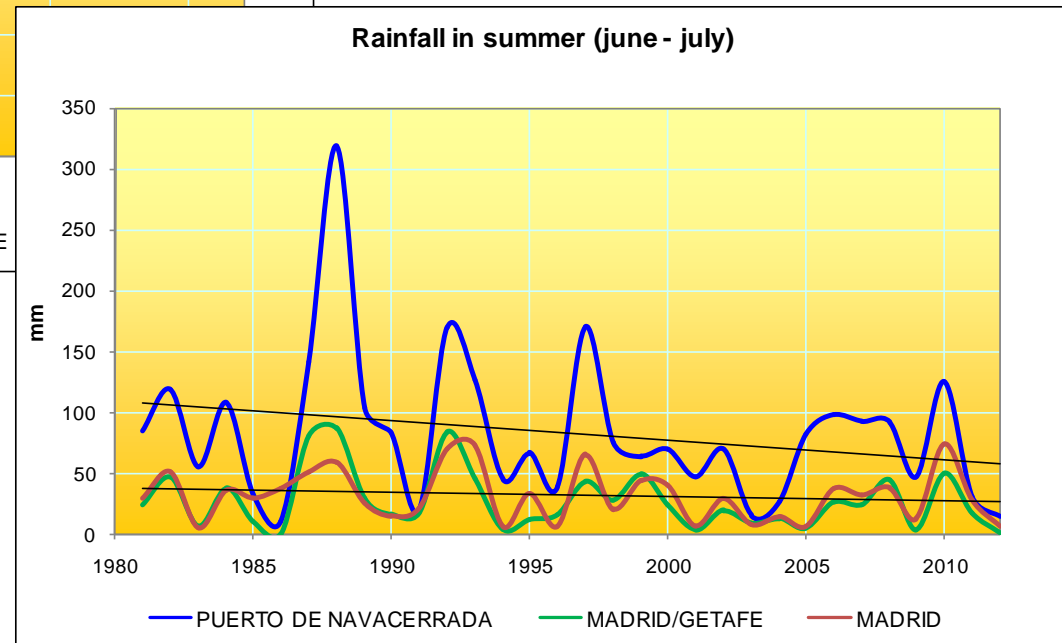
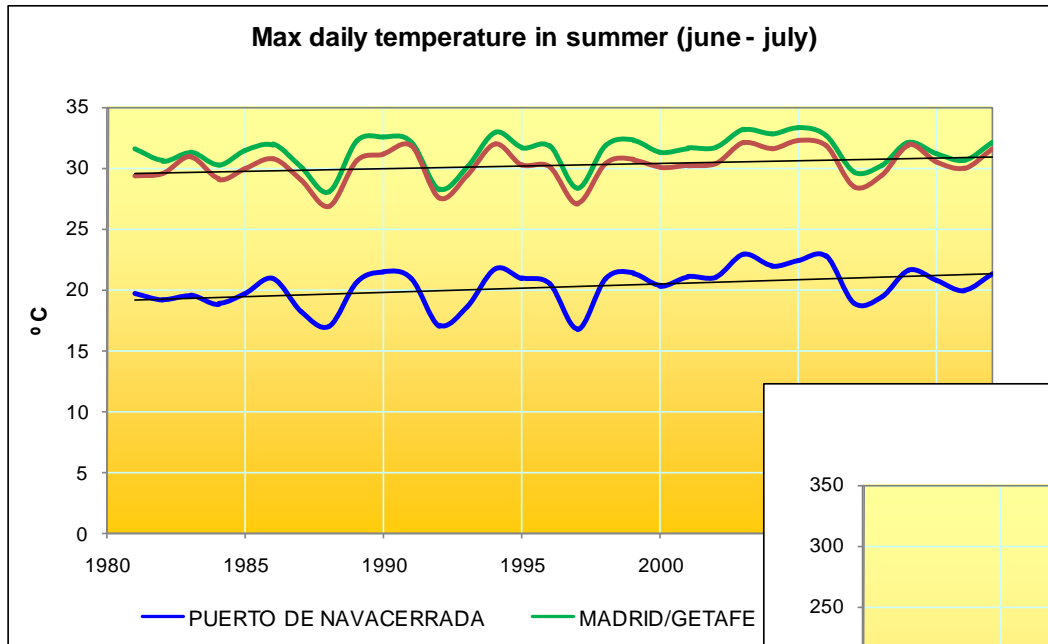


Monitoring of a representative sample of

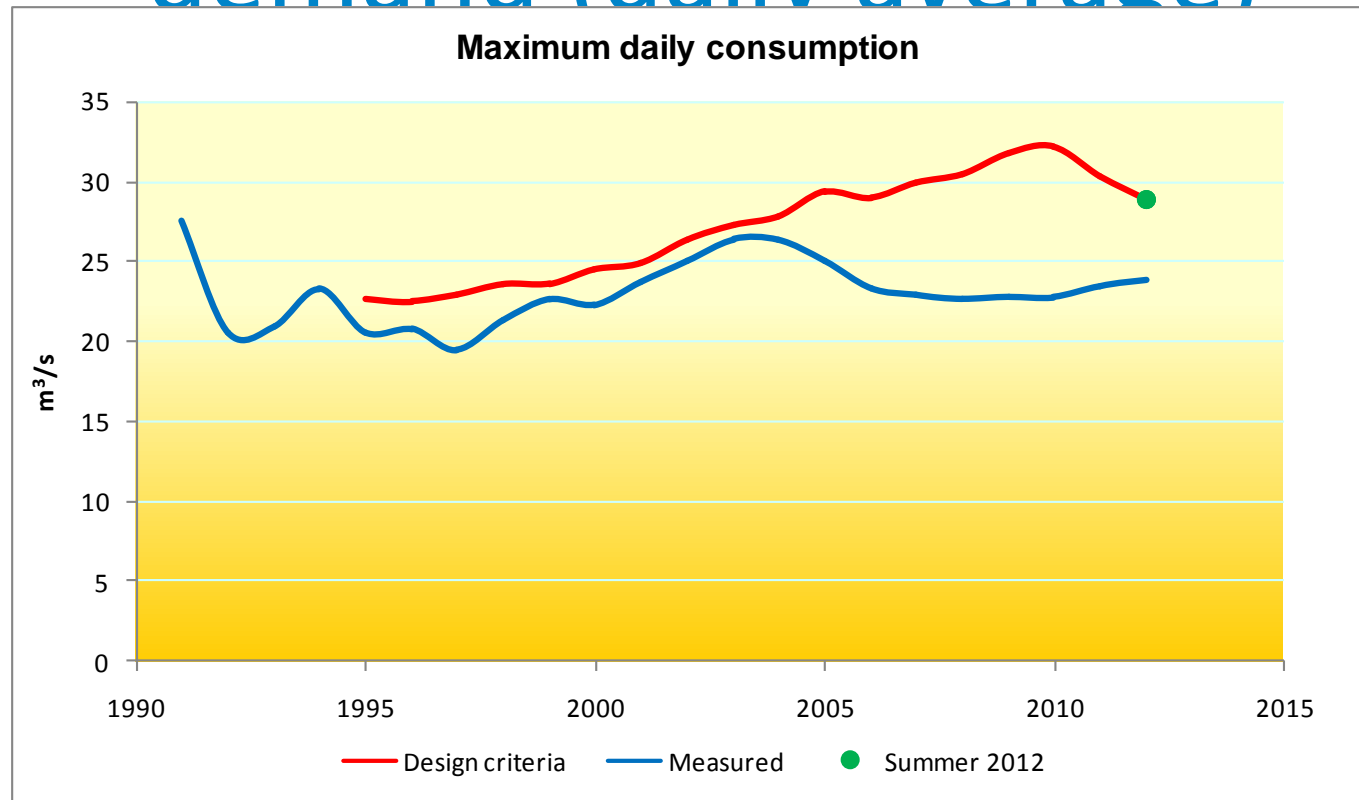


**Permanent sample of 200 dwellings
across the Region, online monitored
since January 2008**

Climatic conditions



Forecast of summer peak demand (daily average)





Thank you

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