

# Urban trees at the center of the Greater Lyon Authority's climate change adaptation strategy



Lyon 8 février 2016



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**GRANDLYON**  
la métropole



# The Greater Lyon Authority

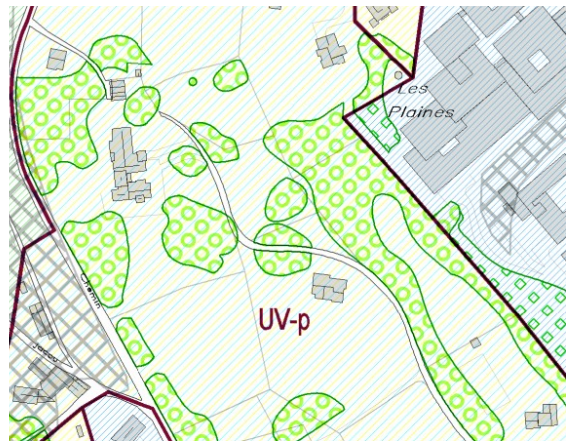
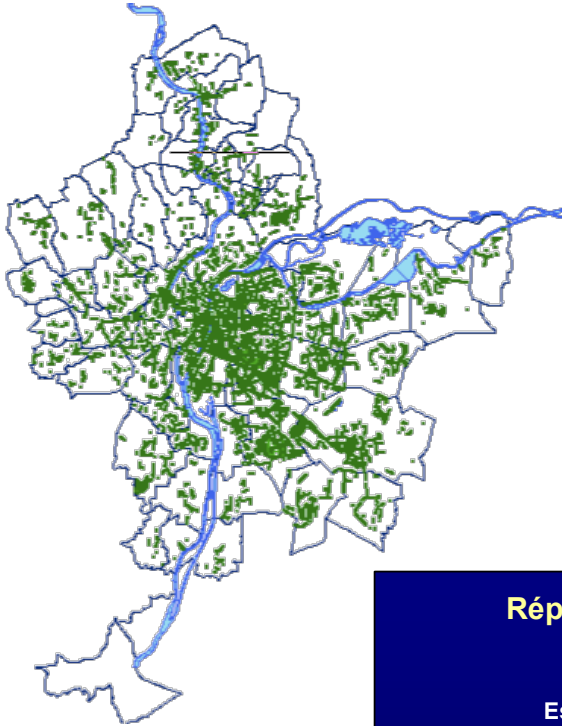
- **59 municipalities**
- **1,3 million inhabitants**
- **53 000 hectares**



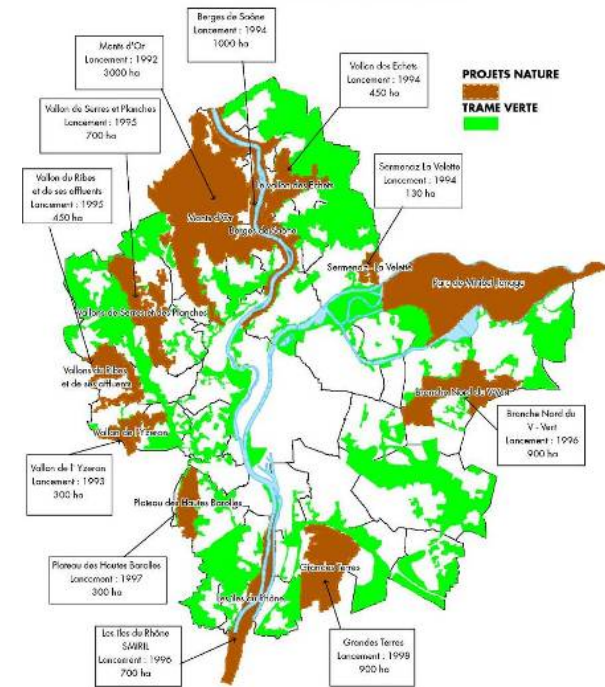
# The Greater Lyon Authority and trees

• **100 000 street trees.**

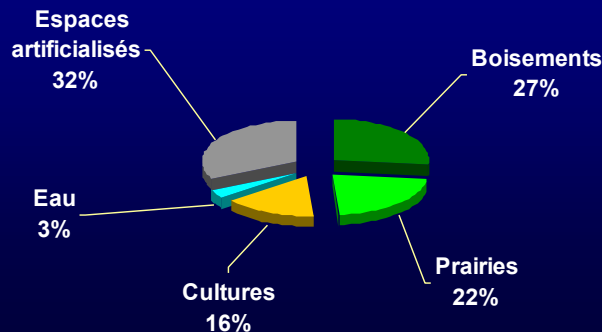
• **9000 Ha of natural green spaces protected and open to public**



PLU - Commune d'Écully



## Répartition des espaces dans le Grand Lyon (image 2009)



• **14 500 Ha of urban tree canopy cover.**

# The origin of the urban plantations

La Place Bellecour en 1860



Les quais de Neuville vers 1900



Bld de la Croix Rouse en 1880



Le Cours de Verdun vers 1900





## A loss of interest in the XXth century





# The value crisis of urban trees in the XXth century

**Garibaldi street in 1910**



**... and in 1992**



**Cours de Verdun in 1900**



**... and now**

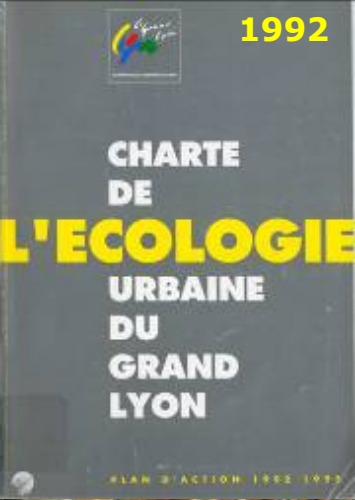




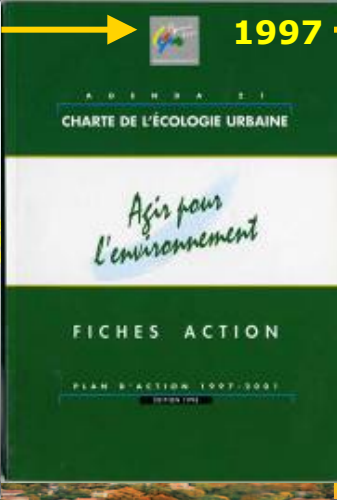
Berges du Rhône 2000



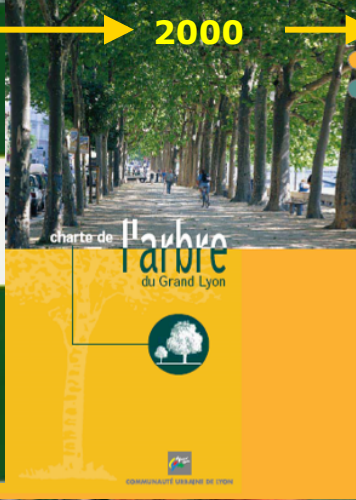
... et 2005



1992



1997



2000



2011

**Greater Lyon Authority's political commitments in favour of an urban tree strategy**





# Development of a landscape culture in urban projets

- **qualitative point of view :**
  - Respect for the charter principle
  - Implication of various services of the Greater Lyon Authority
- **quantitative point of view :**
  - Doubling of the number of trees between 1990 and 2015
  - 42 000 → 100 000 arbres
  - 20 000 trees replaced



Source: Xavier

Requalification of a city entrance highway

# 3 main research areas of the tree charter

1. preservation and enhancement of fertile soil

3. urban nature and climate change

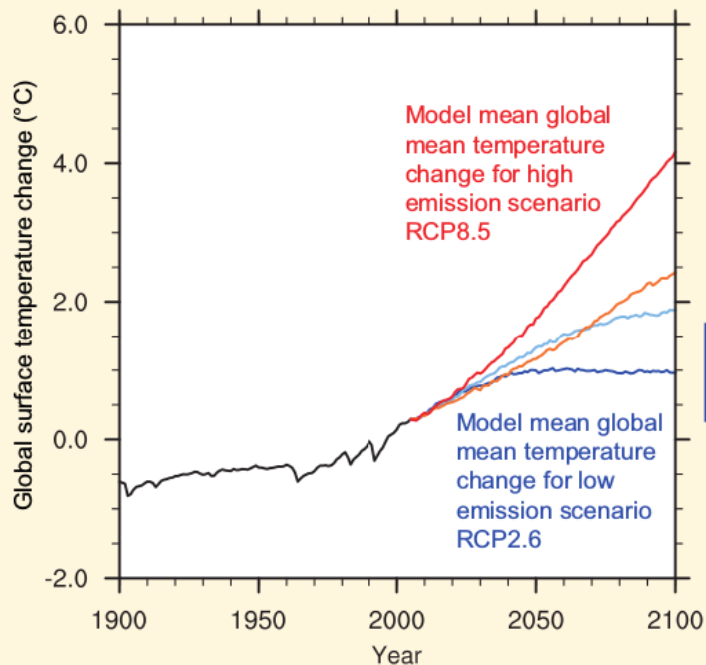


2. landscape and water cycle management



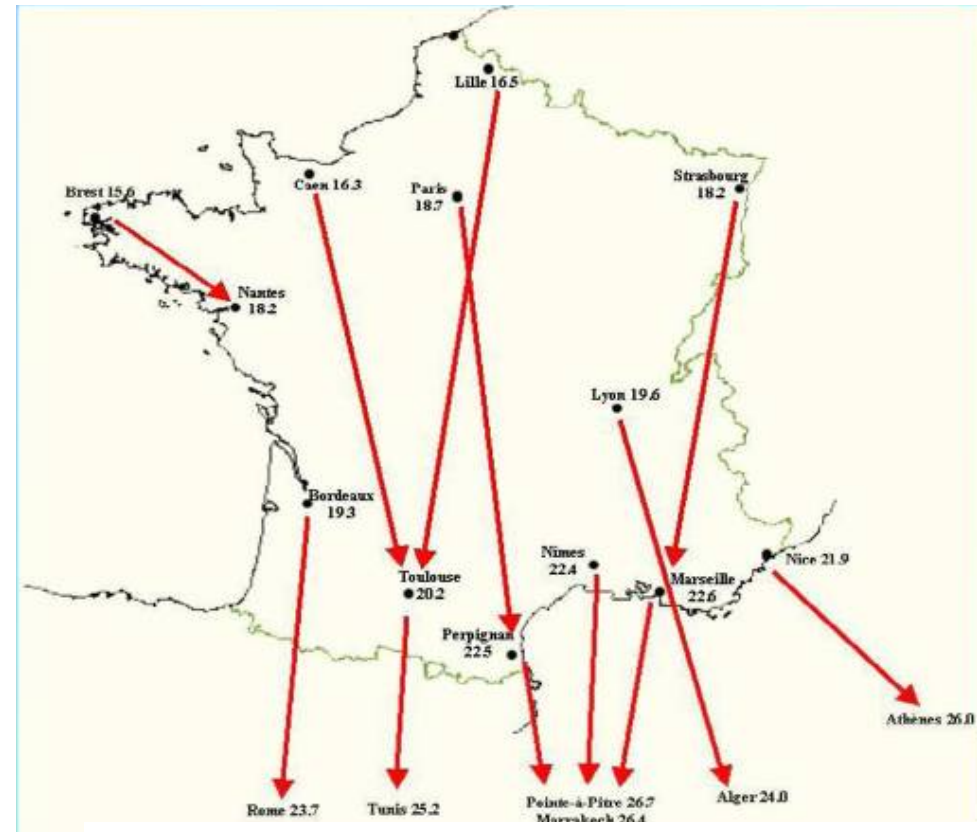
# Climate Change

## The assumptions :



assessment report of IPCC:

[www.ipcc.ch](http://www.ipcc.ch)

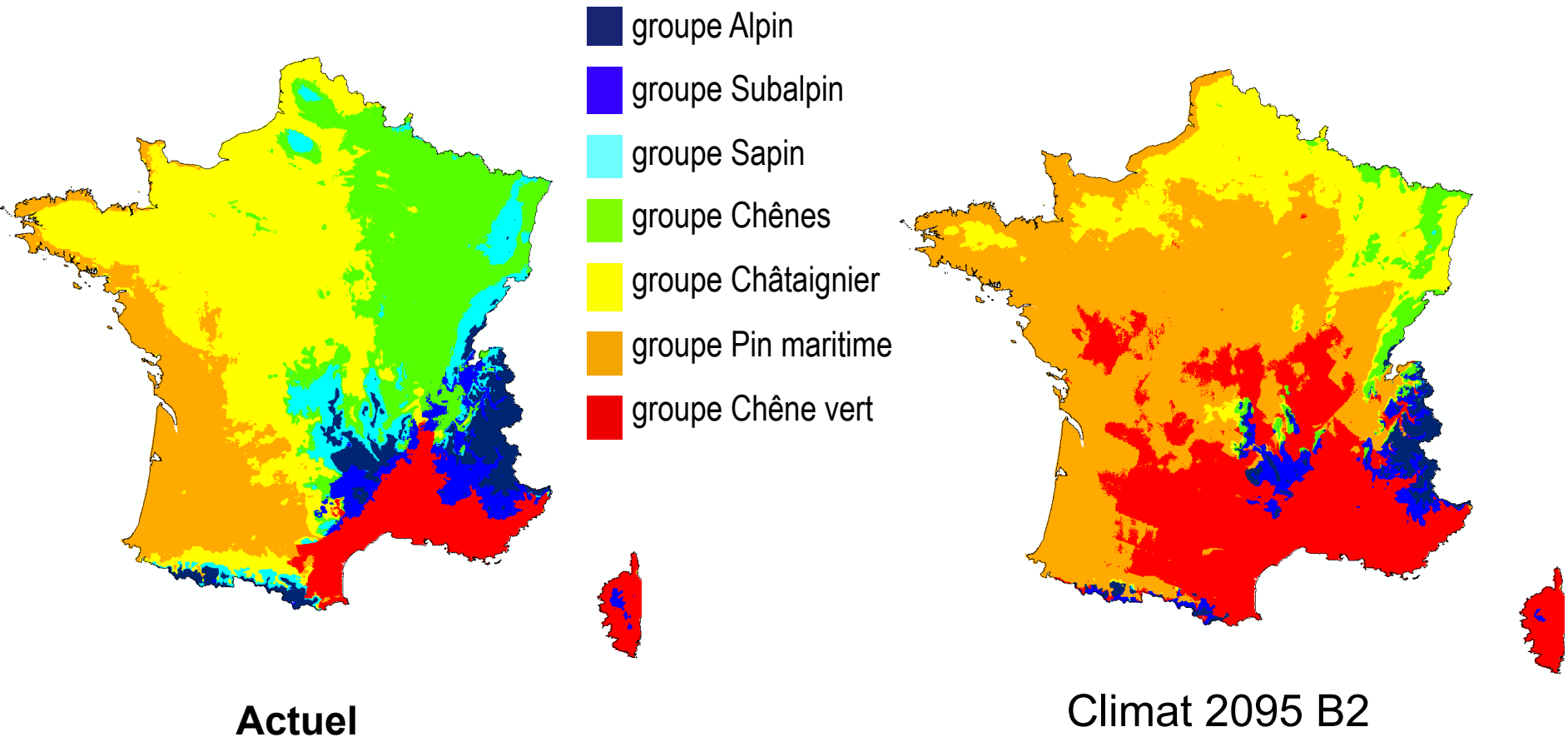


**Prévision des températures moyennes en 2070-2100**

Scenario prudence A2 – source: météoFrance

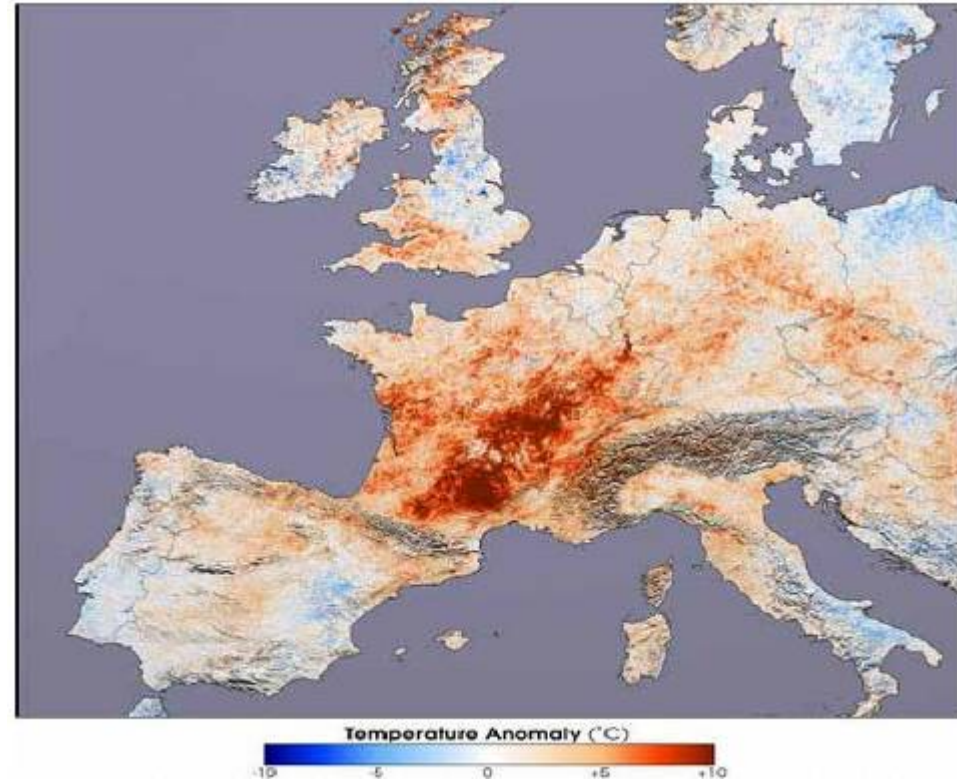
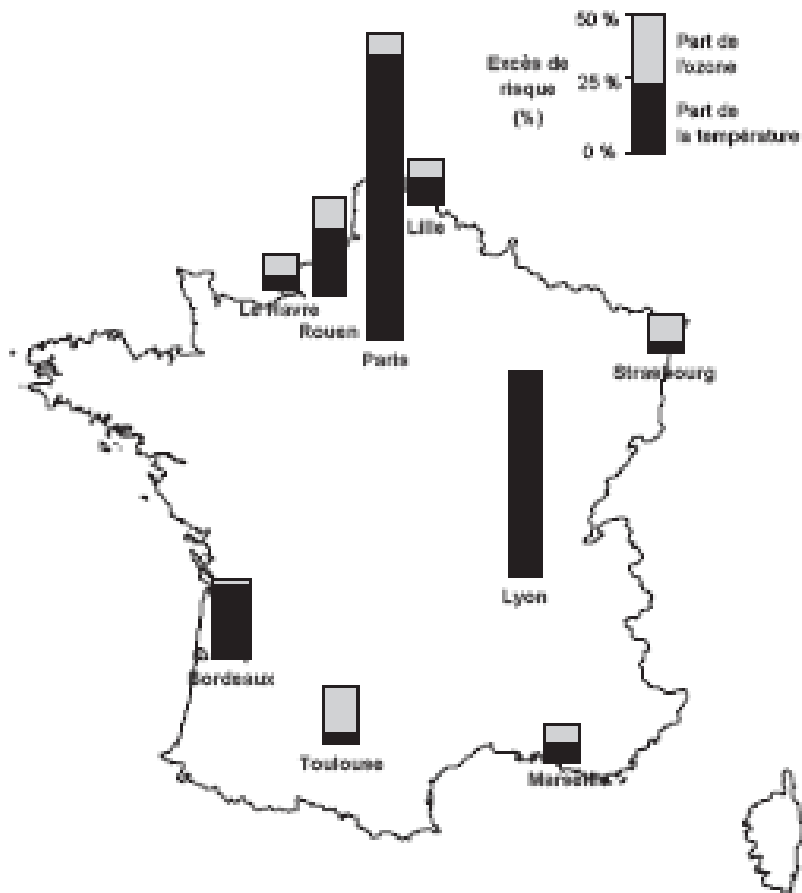


## Impacts on ecosystems and plants distribution

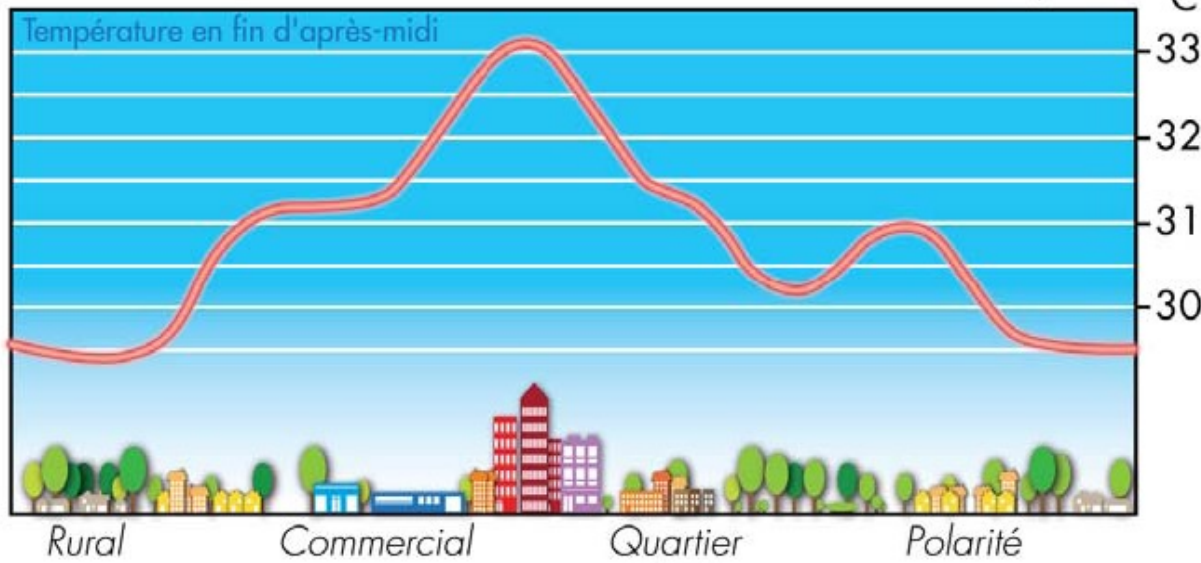


**Anticipate for the choice of species to be planted**

# Sanitary consequences for the populations



- 2003 heat wave in France: 15000 deaths
- excess death rate in Lyon: +80% (+60% in France)

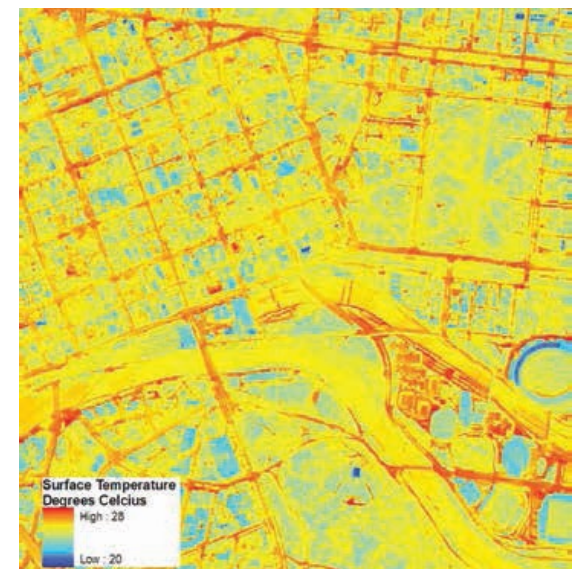
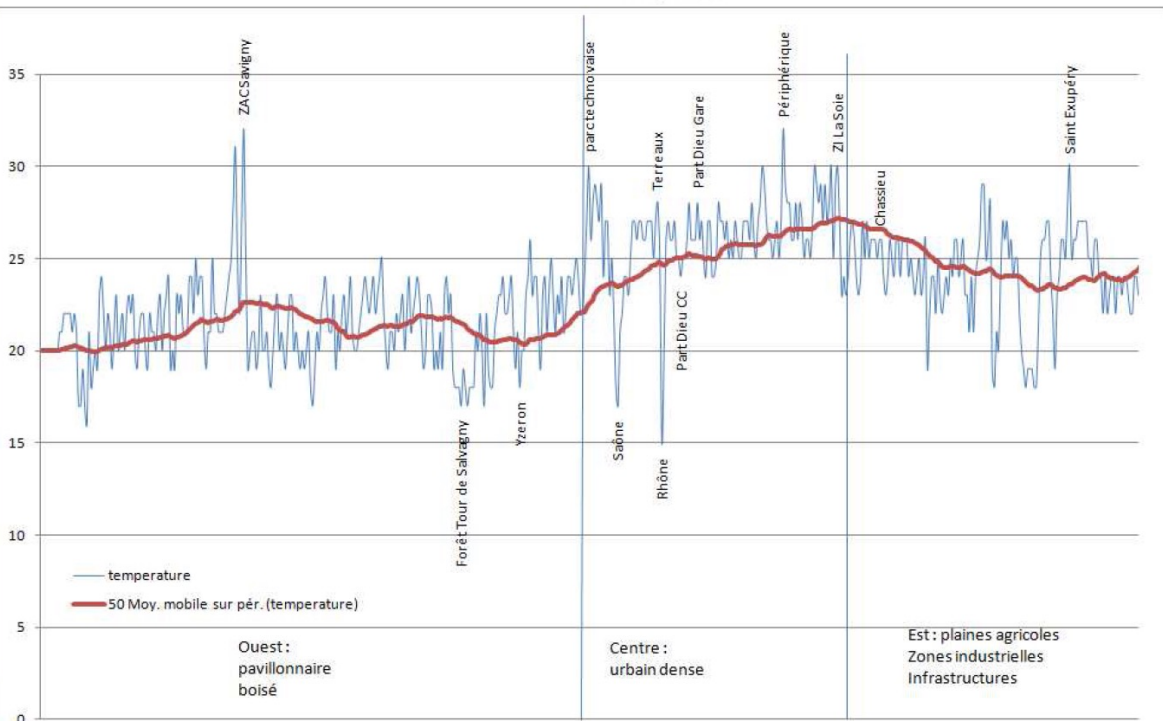


Identification des îlots de chaleur urbains  
 Zone test n°1 : quartier Gratte-Ciel, Villeurbanne

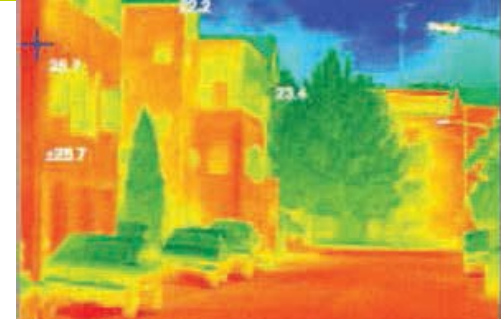
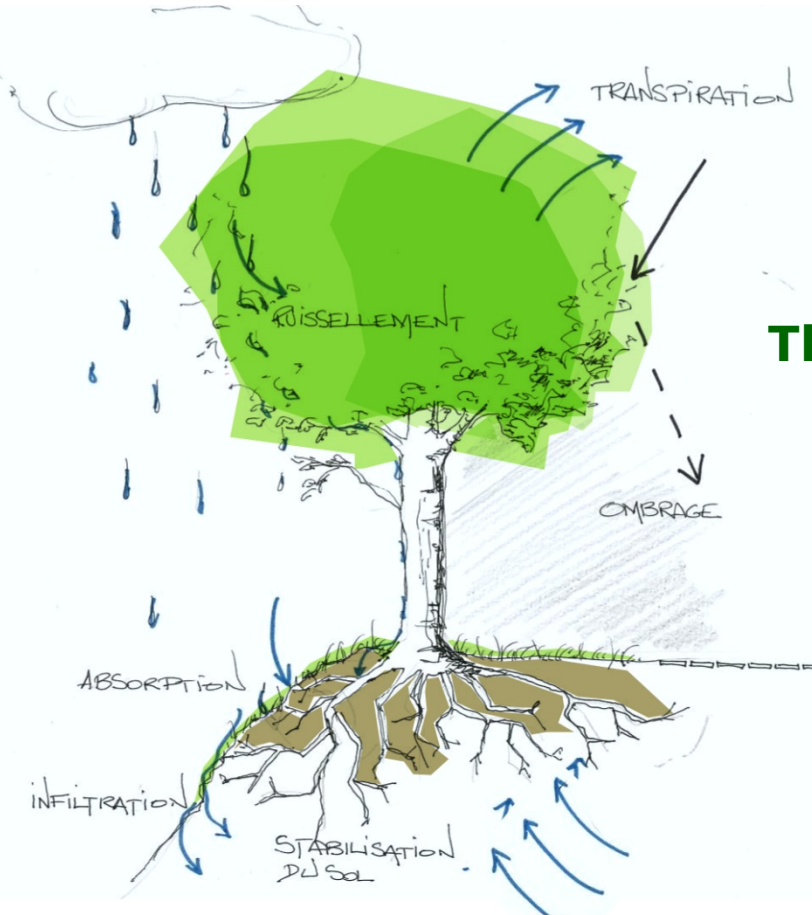


Légende

- SCORE ICU (%)
- [ -11 ; -5 ] : îlot de fraîcheur
  - [ -5 ; 5 ] : ICU nul
  - [ 5 ; 25 ] : ICU faible
  - [ 25 ; 50 ] : ICU moyen
  - [ 50 ; 100 ] : ICU intense
- Établissements sanitaires et sociaux
  - Bâti cadastral



## Effects of trees on micro-climate :



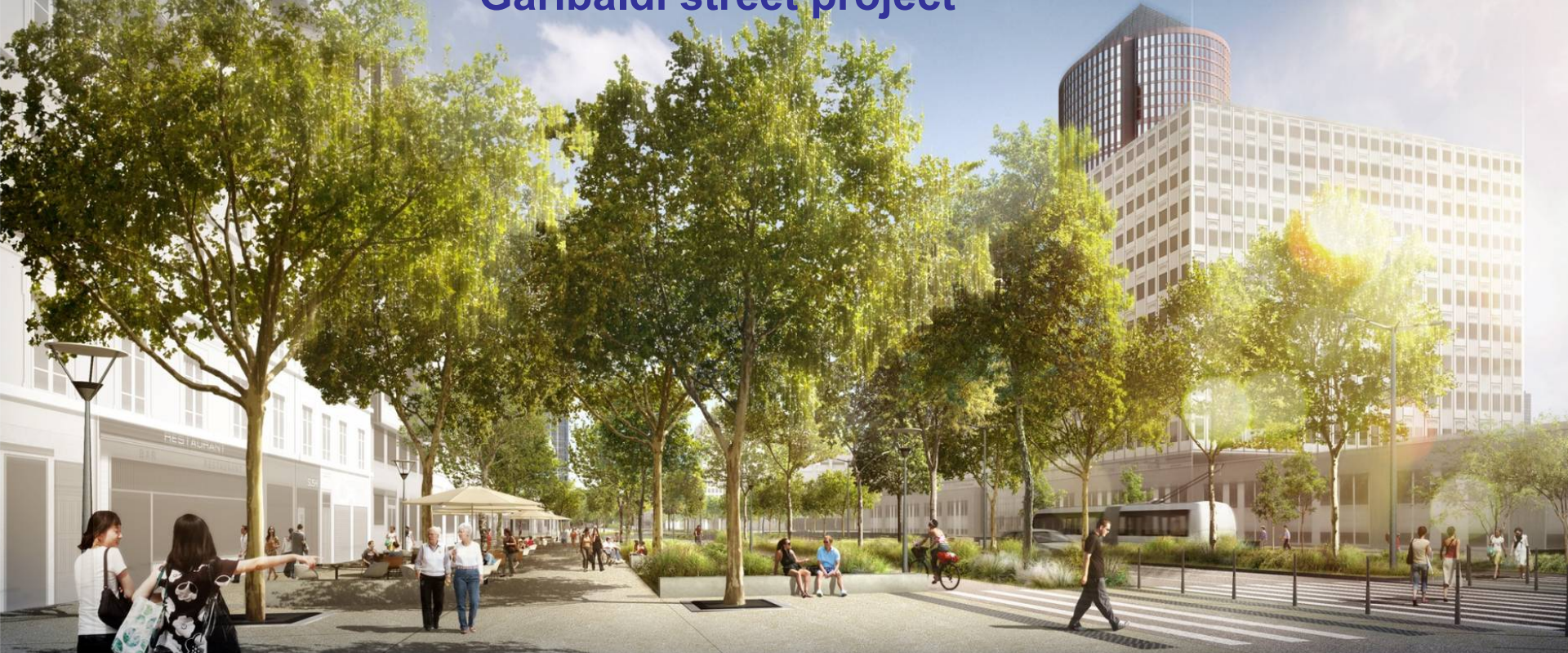
### The actions of tree on the climate :

- Effect of shade
- preventing the accumulation of heat in hard surfaces
- Effect on the flow of the air
- Effect of evapotranspiration

➤ **Linked to the urban water management :**  
**boost the evapotranspiration of trees**



# Gambajai street project





# ARBRES TIGES

Arbres tiges			
Ac	: Erable champêtre ( <i>Acer campestre</i> 'Eclairé')	20/25	11
Af	: Erable de Freeman ( <i>Acer freemanii</i> 'Autumn B')	20/25	10 -1
Oc	: Charme Houdon ( <i>Ostrya carpinifolia</i> )	20/25	11
Pa	: Merisier des oiseaux ( <i>Prunus avium</i> 'Plena')	20/25	6
Ps	: Cérisier d'ornement ( <i>Prunus Sunset</i> Boulevard)	18/20	11
Oc	: Chêne cheveuu ( <i>Quercus cerris</i> )	30/35	24 +1
Ul	: Orme ( <i>Ulmus luteus</i> 'Nangant')	18/20	4 -1
Z'Gv'	: Zelkova du Japon ( <i>Zelkova serrata</i> 'Green V')	20/25	11
	( <i>Platanus orientalis</i> 'Digna')	25/30	1 +1



**Ac** **Ac** **Oc** **Pa**  
*Acer campestre* *Acer freemanii* *Ostrya carpinifolia* *Prunus avium*

# ARBRES EN CEPEE

Arbres en cépée			
Ac	: Erable champêtre ( <i>Acer campestre</i> )	450/50	2
Af	: Erable de Freeman ( <i>Acer freemanii</i> 'Autumn B')	450/50	1
Fo	: Frêne à fleurs ( <i>Fraxinus ornus</i> )	350/40	6
Oc	: Charme Houdon ( <i>Ostrya carpinifolia</i> )	450/50	2 +1
Pa	: Merisier des oiseaux ( <i>Prunus avium</i> )	450/50	2
Pp	: Cérisier à grappes ( <i>Prunus padus</i> 'Waterli')	350/40	7 -1
Ps	: Cérisier d'ornement ( <i>Prunus Sunset</i> Boulevard)	350/40	1



**Ps** **Oc** **Ul** **Z'Gv'**  
*Prunus Sunset Bd* *Quercus cerris* *Ulmus luteus* *Zelkova serrata*

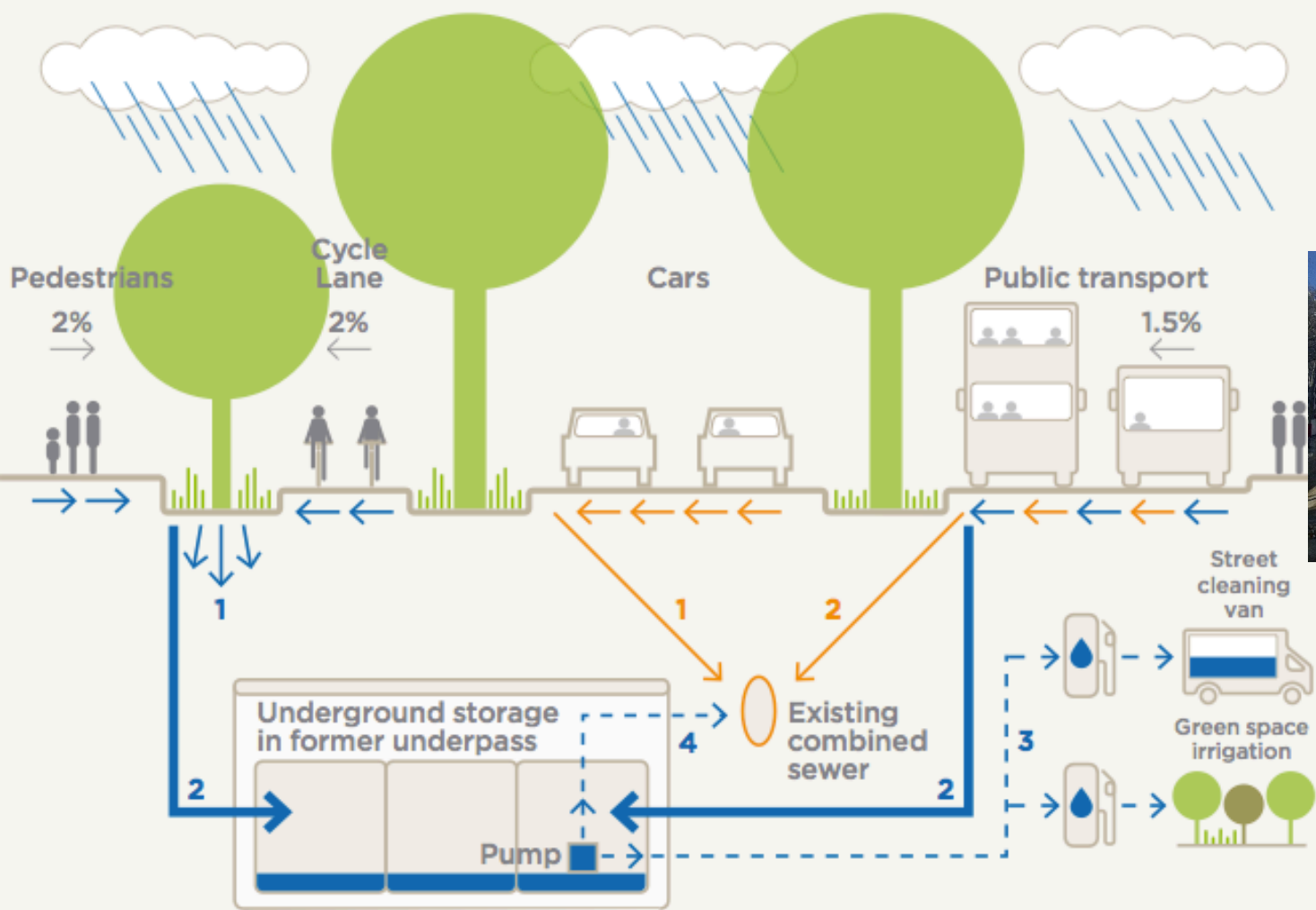


**Ac** **Af** **Fo** **Oc** **Pa** **Pp** **Ps**  
*Acer campestre* *Acer freemanii* *Fraxinus ornus* *Ostrya carpinifolia* *Prunus avium* *Prunus padus* *Prunus Sunset*



# Water management strategy for Garibaldi Street refurbishment

— Polluted surface water runoff  
— Non-polluted surface water runoff



- 1. Surface water runoff infiltration
- 2. Overflow and/or storage of surface water runoff
- 3. Surface water runoff re-use
- 4. Controlled rate outflow into combined sewer (during heavy storms)

- 1. Remains directed to existing combined sewer
- 2. Only directed to combined sewer when winter treatment is applied to the bus lanes



Image courtesy of the Trees and Design Action Group

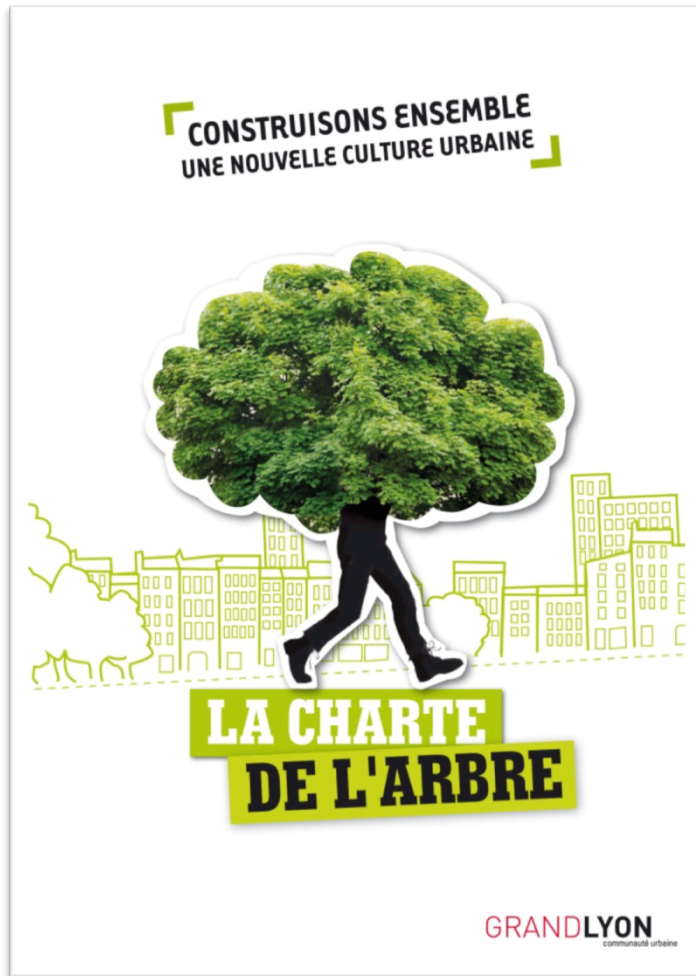
# A commitment ...to take action

- A document common to all the signatories

- Partnership actions plans



- Recommendations for the public policies

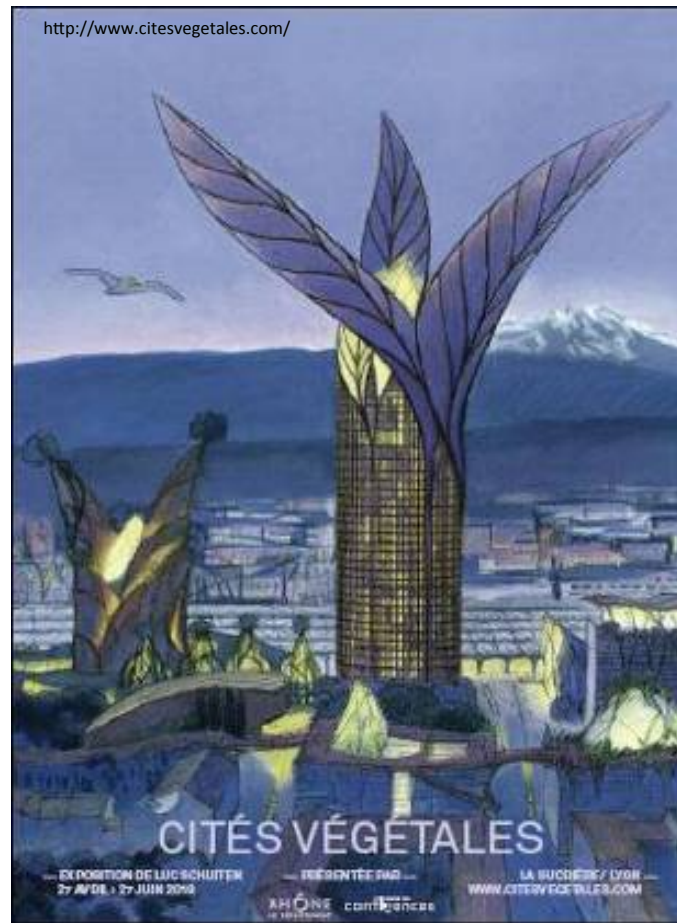




## Trees, health and well-being : city-dwellers at the heart of the change



# How to reconcile nature and city ?





**Thank you for your attention !**

The Tree Charter documents can be searched on :

<http://blogs.grandlyon.com/developpementdurable> rubrique « actions/charte de l'arbre »



**English version available now !!!**

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**La Métropole de Lyon**

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