E²STORMED

IMPROVEMENT OF ENERGY EFFICIENCY IN THE WATER CYCLE BY THE USE OF INNOVATIVE STORM WATER MANAGEMENT IN SMART MEDITERRANEAN CITIES

INTERIM EVALUATION OF PROGRESS MADE TO DATE IN TRANSITION MANAGEMENT

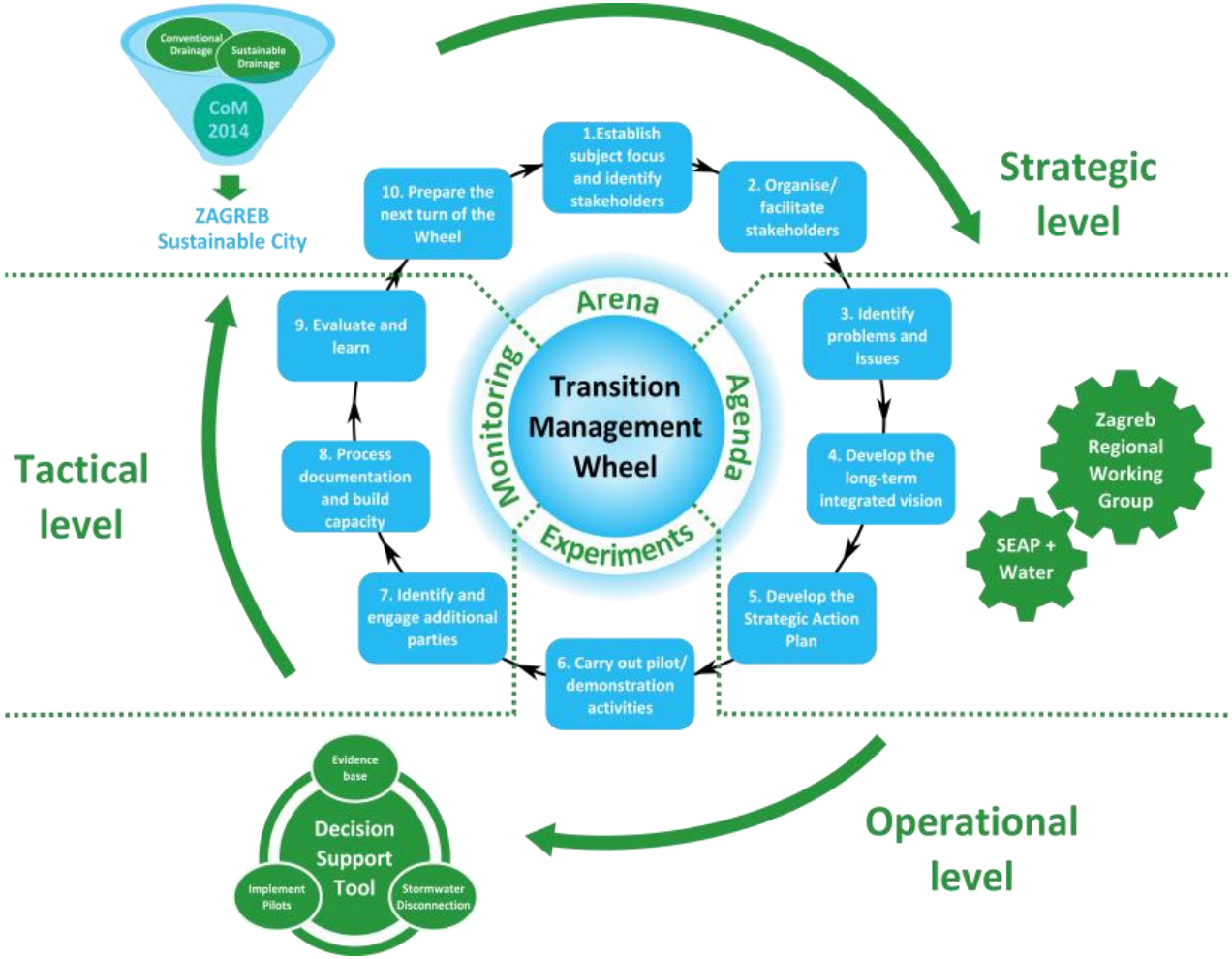
City of Zagreb

30th September 2014

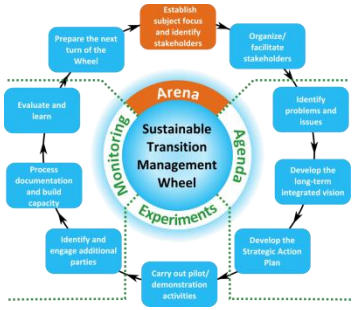
med
L'Europe en Méditerranée
Europe in the Mediterranean

Project co-financed by the EUROPEAN UNION
Projet cofinancé par l' UNION EUROPEENNE

Zagreb Transition Management Wheel



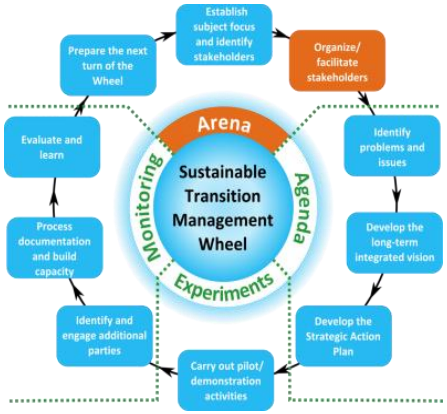
1. Establish subject focus and identify stakeholders



Subject focus: Saving energy through better control of stormwater at the local level

Stakeholders invited to the RWGEE	Participation
Department for Environmental Protection and Waste Management	3 of 3
Croatian Waters	2 of 2
City office for Energetics, Environment protection and Sustainable development	2 of 2
City Office for Planning, Town Building, Construction, Utilities and Transport	3 of 3
City Office for Agriculture and Forestry	1 of 3
Water Supply and Drainage Department	3 of 3
University of Zagreb	3 of 3

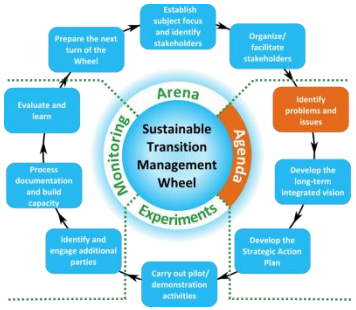
2. Organise / Facilitate Stakeholders



Meetings held:

Date	Nº Attendees	Main outcome of the meeting
27-06-2013	12	Scope of the project and need to improve Zagreb urban water planning to achieve energy efficiency using SuDS and importance of a well-functioning RWGEE
30-10-2013	8	Identification of key problems and potential SuDS solutions application of DST to facilitate decision making
19-09-2014	10	First results of DST software applied to chosen pilot areas

3. Identify problems and Issues



The main problems discussed within RWGEE:

- increasing the number of connections to the public sewage system , overloading the drainage system
- the water supply network, pipelines and its armature are outdated and require accelerated renovation and replacing of damaged parts of the system
- due to urbanisation natural retention areas and waterproof surfaces are reducing and costs for maintaining current and developing new drainage systems are growing
- long dry periods cause low water level of Sava River and low groundwater level
- lack of legislation regarding stormwater management
- need to encourage interests of important stakeholders

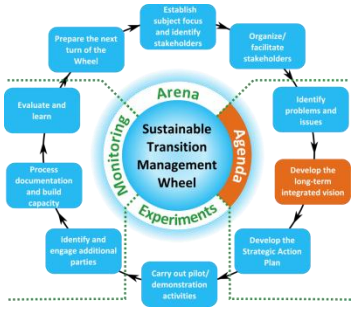
3. Identify problems and Issues

Key energy efficiency issues identified by the RWGEE :

- wastewater and stormwater are drained into the main drainage system and then into the Central Wastewater Treatment Plant
- the Central Wastewater Treatment Plant includes following fundamental parts:
  - Inflow pumping station with screw pumps
  - Conventional, mechanical treatment
  - Biological treatment stage including sludge technology and final clarification tank

- it is necessary to unload wastewater treatment plant and to reduce pumping and treatment costs

4. Develop the long-term integrated vision



- The City of Zagreb accepted the Covenant of Mayors on 30th October 2008
- The City of Zagreb is also a member of the Croatian Club CoM which strengthens the Croatian network of sustainable cities
- SEAP has been developted and includes numerous energy efficiency measures which will contribute in fulfilling the four basic objectives of European energy policy until 2020 (20/20/20)
- There is a potential to include stormwater management measures for adoption by the city if the evidence base is provided for delivering energy savings related to CO_2 emissions

Concepts suggested to form part of the vision statement

4. Develop the long-term integrated vision

- the key words of the long-term integrated vision are:

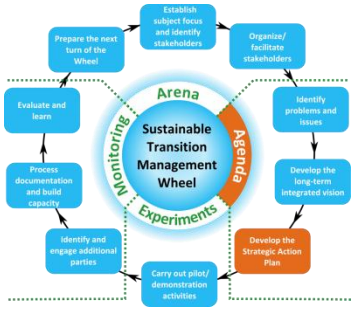
➢ to facilitate the change towards more sustainable solutions for resources and urban water systems

➢ to integrate conventional practices and sustainable drainage techniques to deliver energy efficiency gains thus reducing CO_2 emissions

➢ to integrate sustainable urban water management strategies which deliver energy efficiency into the SEAP and submitting this amendment to CoM for approval by their technical committee

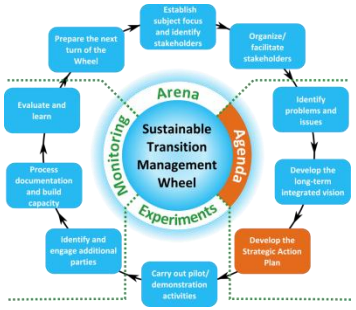
Concepts suggested to form part of the vision statement

5. Develop the Strategic Action Plan



- this plan should describe the main communication, legal and technical actions planned to improve energy efficiency in stormwater management.
- the solidity-sustainability of the project after the project's life will be based on the compromise that the municipalities will implement this action plan.
- adapted stormwater regulations should help local administrations, decision makers and other energy and water cycle stakeholdes to account for energy efficiency aspects when deciding on different alternatives/solutions, especially water related.

5. Develop the Strategic Action Plan



- Due to connection to the mixed drainage system there are no special regulations and policies that could define the requirements for building sustainable drainage systems.
- the main current legislative and regulatory frameworks available to develop strategic action plan include:

➢ Energy development strategy of Croatia

➢ Act on efficient use of energy in final energy consumption

➢ Law on water

➢ Water management strategy

➢ Energy efficiency program

➢ The Sustainable Energy Action Plan of the City of Zagreb (SEAP)

5. Develop the Strategic Action Plan

- ✓ to include SuDS in the legal framework and to define precisely the stormwater planning issues it is necessary to collect the required data implemening small pilot SuDS projects
- ✓ pilot SuDS projects should be implemened in different climate areas and different regions of Croatia to collect more precise local and climate data
- ✓ based on collected data about the efficiency and applicability of these systems and in the case of evidence it can be decided to include these solutions into legal framework

5. Develop the Strategic Action Plan

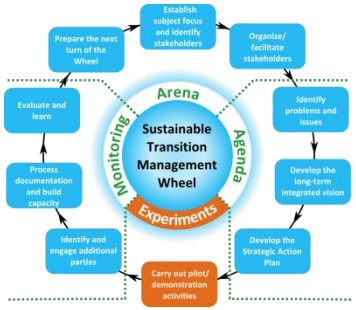
- ✓ it is necessary to adopt a new local water protection plan or decision on waste water in the urban area
- ✓ at national level the existing legal framework should be amended on the basis of the results of the pilot projects and studies
- ✓ by implementing of SuDS it is necessary to define the legal responsibility for the management and maintenance of these systems

5. Develop the Strategic Action Plan

- **Short-term goals** should provide:

- reduction in CWWTP pumping and treatmenmt costs
- reduction in the amount of potable water used by providing rain water harvesting measures for non-potable uses
- reduction in combined sewer overflows to Sava River
- disconnection from the sewer network that will not cause flooding to surrounding neighbourhoods
- identify funding sources to implement SuDS pilot activities
- to influence change and update regulations at the city level to allow stormwater disconnection using outcomes from the strategies outlined above

6. Carry out pilot / demonstration activities



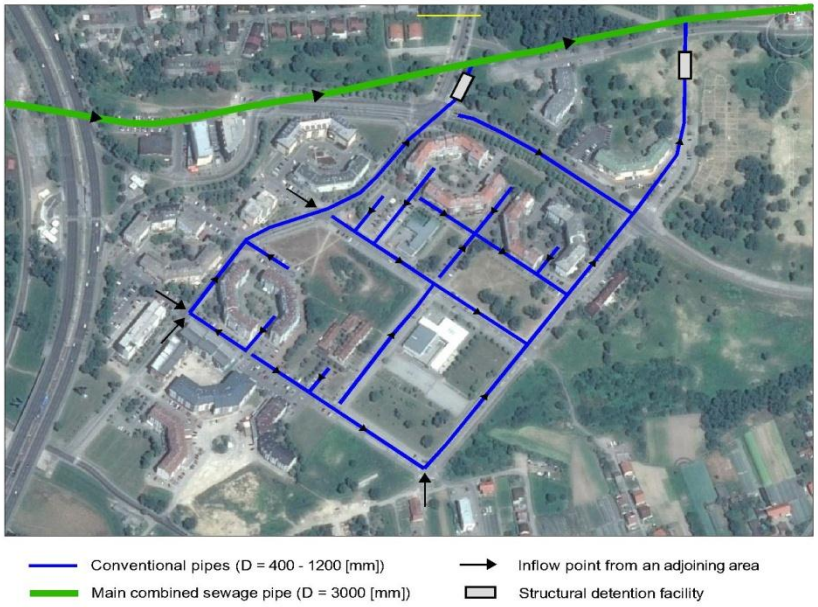
- Analysis of outputs delivered by the DST for 2 stormwater management scenarios:
  - ➢ developed area of Borovje
  - ➢ new development of Podbrežje

- After comparison of conventional with SuDS solution for each location , DST outputs should provide economic and functional evidence base for disconnecting stormwater and implementing pilot SuDS projects

6. Carry out pilot / demonstration activities

- **BOROVJE (developted area)**

➢ Conventional system :



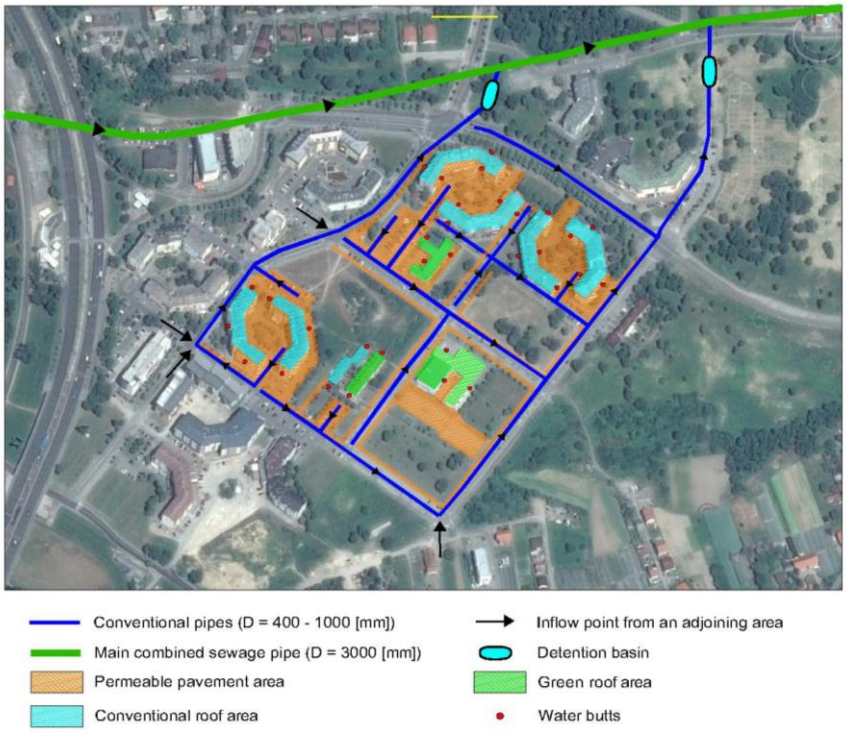
Main problems/issues solved:

- Increased flood protection
- Structural detention facilities reduce runoff peak
- low suspended solids removal

6. Carry out pilot / demonstration activities

- **BOROVJE (developted area)**

➢ SuDS system :



Main problems/issues solved:

- Increased flood protection
- Source improvement of stormwater quality
- Runoff peak reduction

Expected benefits:

- Lower energy consumption
- Lower CO_2 emissions
- Reuse of rainwater
- Ecosystems services increase

6. Carry out pilot / demonstration activities

- **PODBREŽJE (new development area)**

➢ Conventional system :

Main problems/issues solved:

- Increased flood protection
- Structural detention facilities provide runoff peak reduction
- low suspended solids removal

6. Carry out pilot / demonstration activities

- **PODBREŽJE (new development area)**

➢ SuDS system :

Main problems/issues solved:

- Increased flood protection
- Source improvement of stormwater quality
- Runoff peak reduction

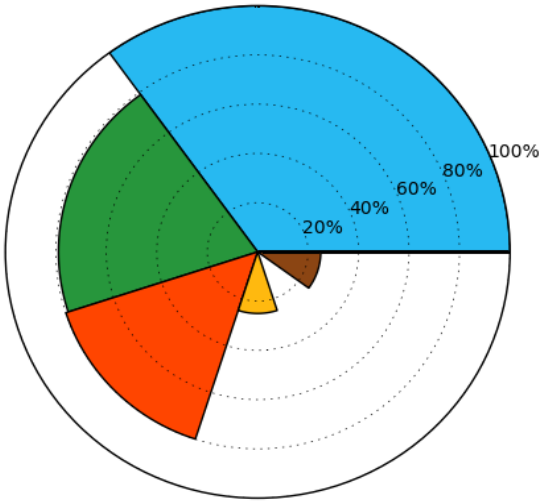
Expected benefits:

- Lower energy consumption
- Lower CO_2 emissions
- Ecological benefits

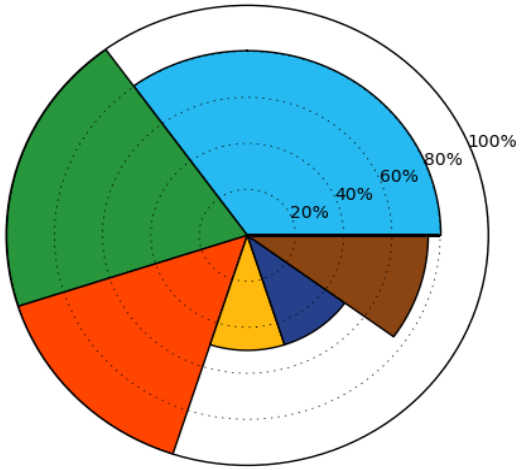
6. Carry out pilot / demonstration activities

Multi-criteria analysis results

- **BOROVJE (developed area)**



Conventional solution

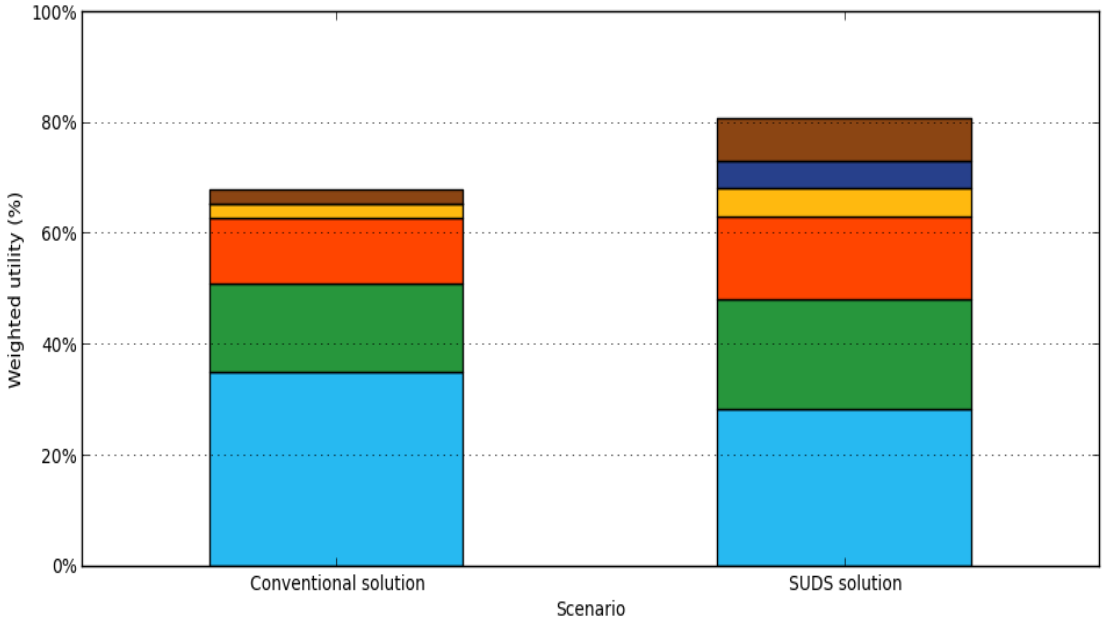


SuDS solution

6. Carry out pilot / demonstration activities

Multi-criteria analysis results

➢ BOROVJE (developed area)

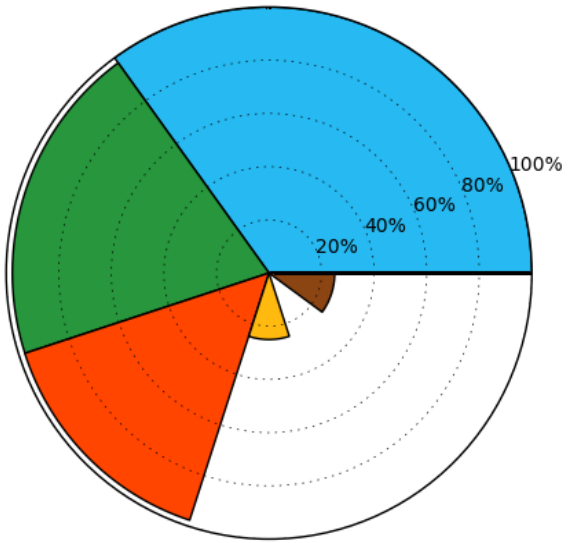


- Larger scores on ecological, energy and social criteria give the SuDS scenario a higher overall score

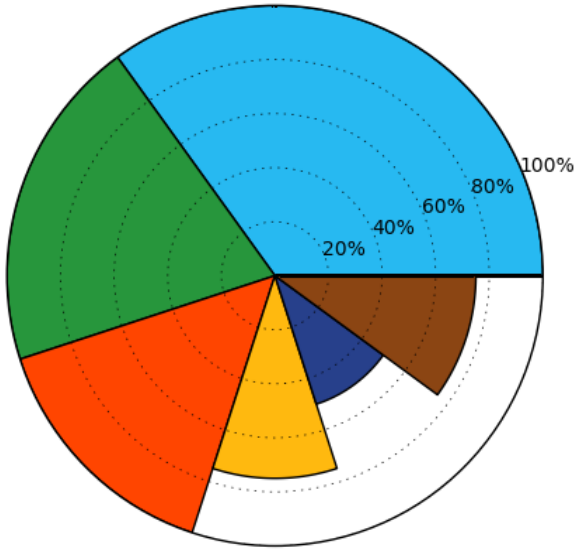
6. Carry out pilot / demonstration activities

Multi-criteria analysis results

- **PODBREŽJE (new development area)**



Conventional solution

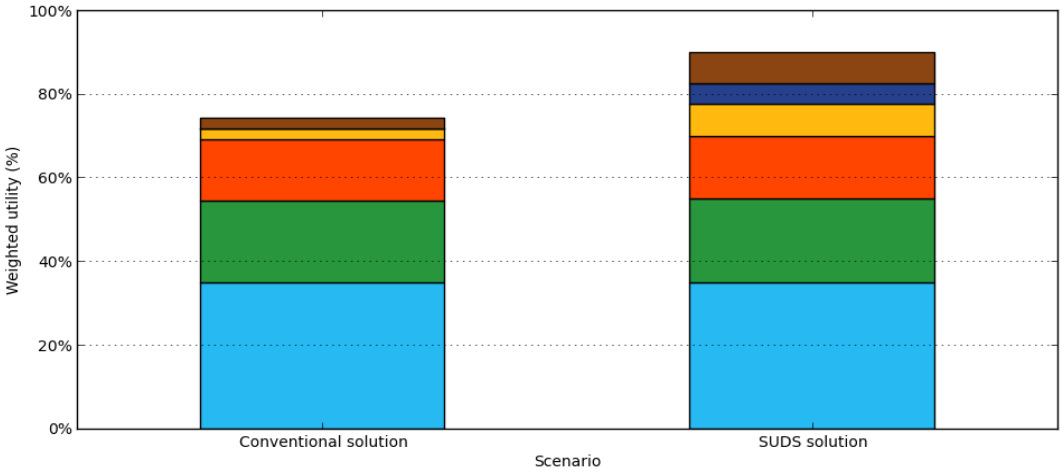


SuDS solution

6. Carry out pilot / demonstration activities

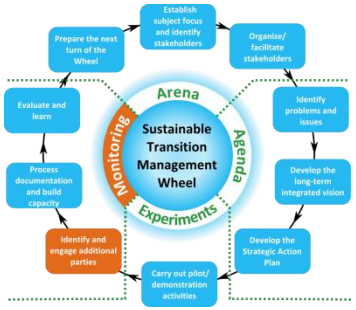
Multi-criteria analysis results

➢ PODBREŽJE (new development area)



- Larger scores on ecological and social criteria give the SuDS scenario a higher overall score

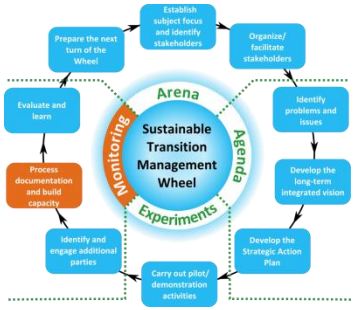
7. Identify and engage additional parties



Work in Progress.

- by further implementation of the project activities we are planning to include more stakeholders and maybe some NGOs
- through dissemination of the project activities more citizen will be informed about the project and importants of its outcomes and achieved energy efficiency
- media will be involved within next Zagreb Energy Week during which E2STORMED project will be presented

8. Process documentation and build capacity



Work in Progress.

- **Process Documentation** will be ongoing throughout the project. The minutes delivered following each meeting tracked the process of change allowing RWGEE members to monitor progress with transitioning activities. This transition case study and evaluation of each activity is also a process document.

8. Process documentation and build capacity

Capacity Building

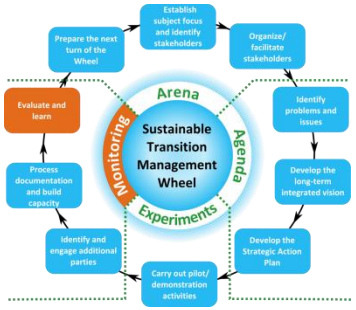
- There are many activities regarding energy efficinecy amongs the stakeholders and public, but there still low citizen awareness in relation to energy and the urban water cycle
- Zagreb Energy Week

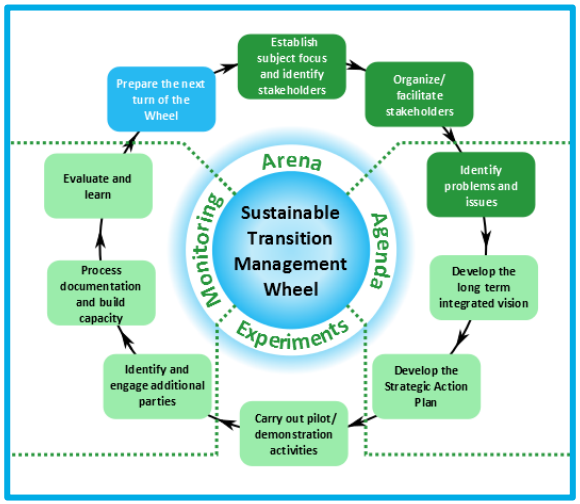
8. Process documentation and build capacity

Capacity Building:

- Attending a special SuDS visit organized by the Academic parner in Scotland (Abertay University) that covered a range of SuDS such as ponds, swales,basins, filter drains and green roofs, highways and public buildings
- This visit was useful to see first-hand how to implement SuDS and achieve energy efficiency

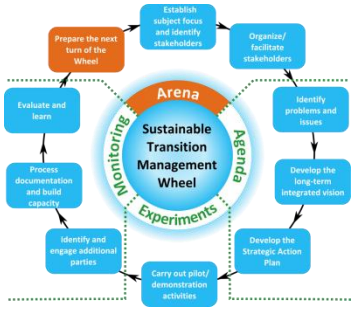
9. Evaluate and learn





Activity	Evaluation
1	RWGEE formed by a good mix of representative stakeholders.
2	Meetings are occurring as scheduled. Members show a high interest on this project and have shared their strategies/agendas.
3	Urban water problems and energy issues have been identified with offers for data sharing / collection between stakeholders to help quantify them.
4	Vision is WIP and will involve amending the SEAP to include energy efficient stormwater management procedures.
5	WIP - There are no Municipal or Regional regulations to relate to so guidelines will be developed with help from academics and written into the strategic plan
6	WIP – There is the opportunity to change local regulations if the evidence base for stormwater disconnection can by proven.
7	Still to be identified by RWGEE.
8	Some events have taken place for capacity building. Process documentation will be ongoing throughout the project.
9	Analysis is underway and will also be ongoing until project end.
10	End of project conclusion – gaps and vision suitability review.

10. Prepare the next turn of the wheel



Scheduled to start in March 2015.

Scheduled to start in March 2015.
This will be the end of project conclusion for transitioning progress based on activity 9 with any gaps identified, new knowledge available etc. which may result in a review of the vision.

Thank you for your attention…

Kristina Ercegovac
City of Zagreb