JESSICA for Smart and Sustainable Cities

Background Paper
Research Findings

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Purpose of the Study

“to investigate how JESSICA implementation could promote and sustain the development of smart cities and in doing so, help deliver EU 2020 objectives”
Presentation Overview

- Research Questions
- Research Approach
- Interviews and Consultation
- Case Study Selection
- Case Study Key Players and Initiatives
- How Initiatives Start
- Case Study Projects
- Collaborations and Partnerships
- Financing of Projects
- Potential role of UDFs
- Possible project types appropriate for UDF investments
- Challenges
- Key Findings
- Smart and Sustainable Cities – EU 2020
- Discussion Questions
Research Questions

How do smart and sustainable city initiatives start?
Who are the key players?
How are projects organised?
How are projects financed?

To help understand the role of Urban Development Funds in smart and sustainable city project financing
Research Approach

- Desktop research
- Key player interviews
- Case study research
- Case study interviews
- Identify issues for further debate
# Interviews and Consultation

<table>
<thead>
<tr>
<th>22@Barcelona</th>
<th>Amsterdam Innovation Motor</th>
<th>Cisco</th>
<th>City of Amsterdam</th>
<th>City of Malmö</th>
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<tbody>
<tr>
<td>E.ON</td>
<td>European Investment Bank</td>
<td>European Commission</td>
<td>GE</td>
<td>HSB</td>
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<tr>
<td>IBM</td>
<td>Institute of Sustainability</td>
<td>Jones Lang La Salle</td>
<td>Manchester City Council</td>
<td>Manchester Digital Development Agency</td>
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<tr>
<td>Manchester: New Economy</td>
<td>Mazars</td>
<td>MKB</td>
<td>Nuon</td>
<td>Riksbyggen</td>
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<tr>
<td>Siemens</td>
<td>Smart Grids GB</td>
<td>SOM Architects</td>
<td>WSP</td>
<td>Urban Splash</td>
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**Sponsors:**
- Mazars
- WSP
- Jones Lang LaSalle
- European Investment Bank
Case Study Selection

Best Practice in Smart Cities
Opportunity to Employ JESSICA
Geographical Diversity
Scale: City-Development

Manchester
Barcelona
Amsterdam
Malmö

Hard / Soft
Manchester

Key Players
- Manchester City Council
- New Economy
- Manchester Digital Development Agency
- Manchester: Knowledge Capital

Initiatives
- SMARTiP
- PEPESEC
- IntelCities
- EPIC

Digital Strategy
Lead by Manchester Digital Development Agency

SMARTiP
Leader of initiative focusing on ‘smart citizens’ and high-quality, efficient public services
Barcelona

Key Players
- Barcelona City Council
- PEMB
- 22@Barcelona
- Cisco

Initiatives
- Smart+ Connected Communities
- Smart SSP
- LIVE Barcelona
- Barcelona Digital Technology Centre

Cisco
- Are working in collaboration with Barcelona to support the city’s 2020 vision

BDigital
- is carrying out research in ICT applications for energy and mobility
Amsterdam

Key Players
- City of Amsterdam
- Amsterdam Innovation Motor
- Liander
- NUON

Initiatives
- Amsterdam Smart City
- Amsterdam Living Lab
- FIREBALL

AIM
Was set up to help stimulate innovation in Amsterdam

Living Lab
Is used to support initiatives, including Amsterdam Smart City
Platforms and services to promote sustainable lifestyles is the focus of the PERIPHÉRIA initiative which Malmö participate in.
How initiatives start

- City-wide strategic or spatial planning strategies
- Relationships between city authorities and private partners
- Technology development and innovation
- Leadership and enabling platform from city authorities
Manchester

- 48% Target reduction in carbon emissions by 2020 compared with 1990 levels
- £2m Europe wide internet initiative is being led by Manchester Digital Development Agency
- 6m tonnes of carbon to be saved through a 5 year programme funded by public-private partnerships

- One of the ‘Living Labs’ in Europe, testing new technology such as smart meters as part of the DEHEMS project
- Eastserve project introduced new online services and training in ICT skills to promote community participation and social inclusion
- Corridor Manchester partnership is overseeing major investment including new digital infrastructure and public transport improvements to drive economic growth
Barcelona

5,640 Tonnes of CO2 saved per year as a result of the Solar Thermal Ordinance

55,000 New jobs created in the 22@Barcelona district.

60% of hot water requirements must be generated by solar energy in new or renovated buildings

- **Extension of WiFi network** by Barcelona City Council to **connect services across the city**
- **Bicing scheme uses ICT** to attract people to **sustainable transport**
- **Pilot schemes in smart meters**
- **22@Barcelona district** acting as a test bed for new means of **service delivery**
Amsterdam

- 36 Smart technologies used in Amsterdam Smart City projects
- 40% target reduction in carbon emission by 2025 compared to 1990 levels

- Amsterdam Smart City projects focus on innovative technology, behavioural change, and sustainable economic investments
- ASC includes a project testing an E-management system in Haarlem
- Zuidas is a new sustainable urban centre devoted to international commerce and knowledge development
Malmö

- Successful **collaboration** between partners in the city in **public-private** partnerships
- **Large-scale sustainable developments** including Western Harbour, Hyllie, and Rosengård
- **Strong history of implementing schemes that reduce CO₂ emissions**

<table>
<thead>
<tr>
<th>2020</th>
<th>100%</th>
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<tbody>
<tr>
<td>Target year to be carbon neutral in the city</td>
<td>Renewable energy target by 2030</td>
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</table>

30%

Target decrease in ICT carbon footprint in the city by 2020 as part of the Green Digital Charter
Collaborations and Partnerships
## Financing of Projects

<table>
<thead>
<tr>
<th>Category</th>
<th>Funding Sources</th>
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<tbody>
<tr>
<td>City-wide initiatives</td>
<td>Typically funded by contributions from each party, in the form of time and expertise</td>
</tr>
<tr>
<td>Developer led projects</td>
<td>Raise finance through corporate or project finance. May also look to EU, National Government, City Authorities to assist in financing projects</td>
</tr>
<tr>
<td>Pilot Projects</td>
<td>Sponsorship from technology suppliers, R &amp; D Programmes, City Authorities, Grants</td>
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<tr>
<td>Large Scale Projects</td>
<td>Project revenues/savings?</td>
</tr>
</tbody>
</table>
Challenges and Opportunities

- *Upfront capital investment*
- *Uncertain future savings/revenues*
- *Long term investment*
- *New technology*
- *High risk*
- *Pilot area*
- *Socioeconomic and/or environmental outcomes*

- *Role for UDFs?*
Potential role of UDFs

- Eligible (or partly eligible to receive Structural Funds)
- Revenue generating
- Part of an ‘Integrated Plan for Sustainable Urban Development’
- Collaboration between public and private sectors
- Support achievement of economic, social, environmental goals
- Support Investment Strategy of UDFs
## Possible project types appropriate for UDF investments

<table>
<thead>
<tr>
<th>Digital infrastructure projects</th>
<th>City wide data projects</th>
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<tbody>
<tr>
<td>• new ICT infrastructure</td>
<td>• Data collection, storage, and analysis at a city wide level, potentially through the ‘Cloud’, which can enhance a city’s ability to predict and plan for the future</td>
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<tr>
<td>• high speed broadband</td>
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<tr>
<td>• fibre optic cables,</td>
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<tr>
<td>• wireless, and/or</td>
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<tr>
<td>• networked information systems</td>
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<table>
<thead>
<tr>
<th>Smart Transport and mobility</th>
<th>Area based and renewable energy/energy efficiency projects</th>
<th>Smart and Sustainable Buildings</th>
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</thead>
<tbody>
<tr>
<td>• Bike schemes,</td>
<td>• Combined Heat and Power</td>
<td>• Smart meters</td>
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<tr>
<td>• Real time bus timetable information</td>
<td>• Renewables</td>
<td>• Energy efficiency measures:</td>
</tr>
<tr>
<td>• Electric Vehicle car pools</td>
<td>• Electric Vehicle Charging Points</td>
<td>• Insulation, low energy lighting, efficient boilers</td>
</tr>
<tr>
<td>• Congestion charging</td>
<td>• Sensors to monitor traffic, pollution, emissions,</td>
<td>• Building Integrated Renewables</td>
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<tr>
<td></td>
<td>• Street lighting</td>
<td>• Electric Vehicle Charging Point</td>
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<tr>
<td></td>
<td>• Waste collection systems</td>
<td>• Smart appliances</td>
</tr>
<tr>
<td></td>
<td>• Smart grids</td>
<td>• Motion detectors</td>
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<td></td>
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<td>• Automatic weather forecasting</td>
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</table>

### Smart and Sustainable Buildings
- Smart meters
- Energy efficiency measures: Insulation, low energy lighting, efficient boilers
- Building Integrated Renewables
- Electric Vehicle Charging Point
- Smart appliances
- Motion detectors
- Automatic weather forecasting
Challenges

- Knowledge and capacity
- Leadership
- Multi stakeholder projects
- Procurement
- Intellectual property
- Project development
- Carbon emissions associated with ICT

Education
Awareness Training

Outcome based approach
Key Findings

• **How do smart and sustainable initiatives commence?**
  
  Leadership – City wide initiatives – Pilot projects

• **How are projects organised?**
  
  Multi-stakeholder collaboration- Variety of organisational models – R & D – Technology testing and development

• **How are projects financed?**
  
  City, National, European funding + Provider/Supplier financing
Smart and Sustainable Cities – EU 2020

- **20%**
  - Reduction in greenhouse gas emissions from 1990 levels

- **75%**
  - Of 20-64 year olds to be employed

- **3%**
  - Of the EU’s GDP (public and private combined) to be invested in R&D/innovation

- **20m**
  - Fewer people in or at risk of poverty and social exclusion

- **10%**
  - Maximum school drop-out rate
Discussion Questions

How to be smart: how could **urban transformation projects** be 'smarter' and how could ‘**smart city’ investments** improve sustainable urban transformation?

To what extent could a **technology-led approach** support the delivery of **smart city investments** and be integrated into **city strategies** or Urban Development Fund investment strategies?

Which **smart-city project** types **seldom require public sector support** and which aspects most influence the **commercial viability** of smart-city projects?

Where are the **market gaps for financing** smart and sustainable urban development projects? What forms of **public-sector support** would be most appropriate to tackle this?
Discussion Questions

What types of smart city projects are most suited to JESSICA financing of sustainable urban development?

What is the supply of JESSICA-compliant and investment-ready smart city projects in European cities? If this supply needs to be further developed, what actions would encourage and enable this?

To what extent could JESSICA financing address market failure in the delivery of smart and sustainable urban development projects? How could this be optimised?

What other actions are needed to ensure 'smart investments' deliver sustainable outcomes?
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