



Conference on Aligning local interventions
with the UN SDGs

Integration of Sustainable Development Goals in climate action plans in the city of Glasgow

Abdulrahman Alajmi and Dr. Leticia Ozawa-Media (presenter)
Institute of Energy and Sustainable Development
De Montfort University
Thursday 2nd July, 2020



Background of the study

- Final year project of a BEng Electronics Engineering student
- Following relevant objectives of the SDG-CapaCities ESRC collaborative networking project between UK (DMU) and Japan (IGES)
 - Develop an understanding about climate planning and SDG awareness of cities in two countries
 - Develop a framework of analysis to evaluate the readiness of cities



Aim and objectives

Understand how the city of Glasgow integrate the SDGs into their Climate Action Plans

- Examine Glasgow's climate change mitigation and adaptation plans and how they address SDGs
- Evaluate the sustainability of Glasgow city based on a specific assessment methodology using SDG indicators and GHG emissions
- Provide recommendations on how SDGs can be better integrated in climate action plans for Glasgow city



Glasgow City background

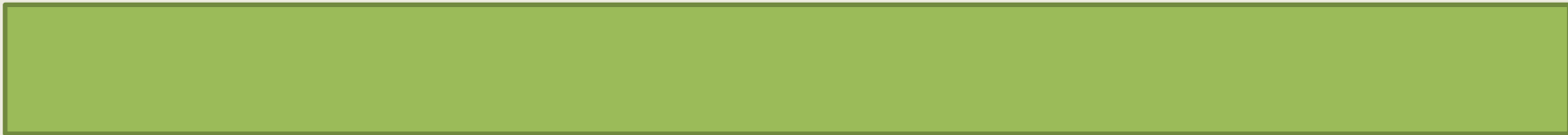
Conference on Aligning local interventions
with the UN SDGs

- One of the majors cities in Scotland
- Population (2019): 633,120 inhabitants
- Population annual growth rate: 0.3%
- Scottish economy powerhouse:
 - More than 18,000 businesses
 - Employment: 312,500 people
 - Gross value added: 19.9 billion GBP
- 2019 UK's top Cultural and Creative City
- Average annual temperature: 8.5°C
- Average annual precipitation: 1,171 mm (UK average: 885 mm)



GHG emissions and reduction targets

- GHG emissions (2017): 2,619 ktCO₂e
 - Industry, commercial and agriculture (35.7%)
 - Transport (33.7%)
 - Domestic (30.3%)
 - LULUCF (0.3%)
- Scotland Climate Change Act 2009 reduction targets
 - 50% by 2030 and 80% by 2050 (1990 baseline)
- Glasgow set a target to become a carbon neutral city by 2030



Methodology

Conference on Aligning local interventions
with the UN SDGs

Understand how
CAPs are
interlinked with
SDGs in Glasgow

- Literature Review
- Desktop analysis of climate action plans in Glasgow



Evaluate the
sustainability
of Glasgow

- Sustainability assessment tool
- City Assessment System for Built Environment Efficiency (CASBEE)
- Data collection for SDG indicators and GHG emissions in Glasgow



Climate Action in Glasgow

Conference on Aligning local interventions with the UN SDGs

Mitigation

Carbon Management Plan

Low carbon energy supply

City Plan 2 & Path for health

Low carbon transport options

Sustainable Carbon project

Urban regeneration

Scottish Government Waste Plan

Waste Recycling

Adaptation

Projects against flooding

E.g. SUDS, maintenance of water courses

Built and natural environment

Climate Ready Clyde

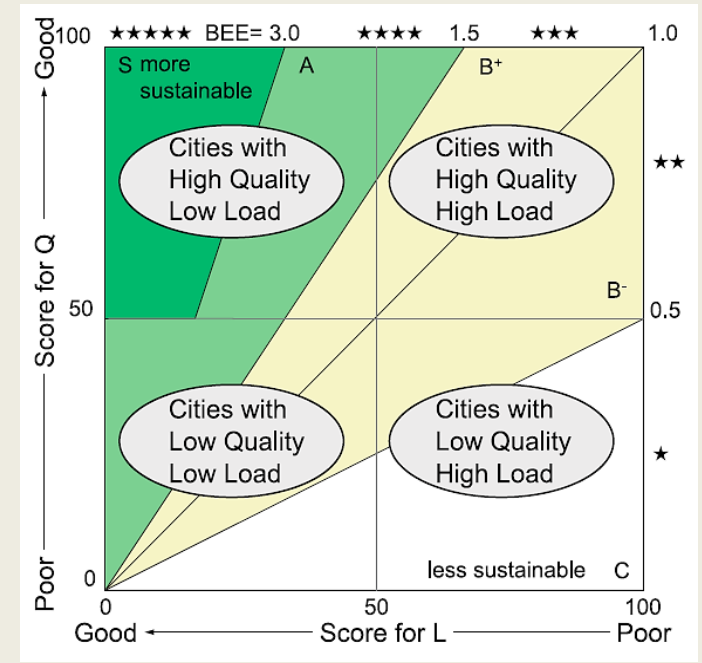
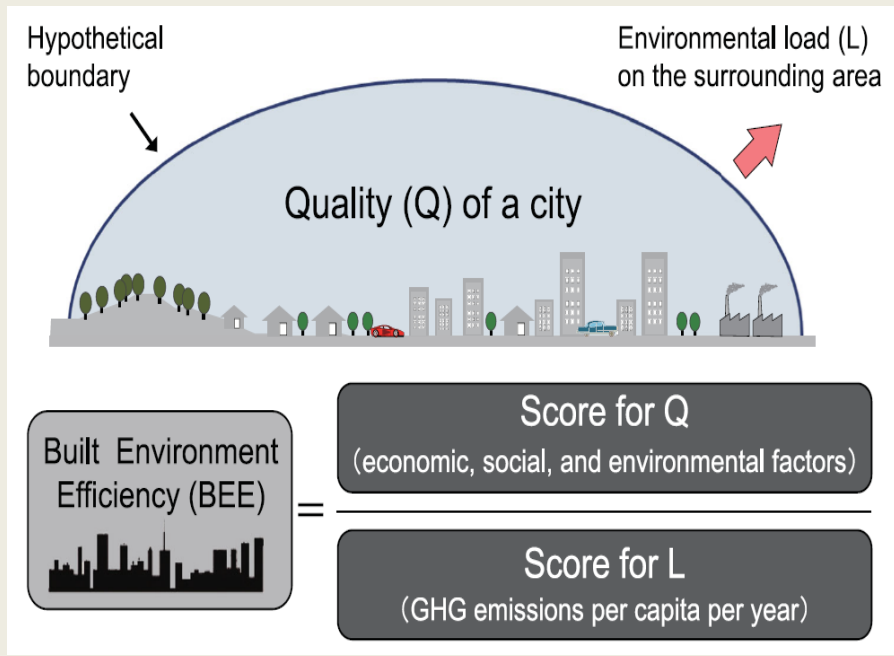
Health and well being

Protection of vulnerable people



City Assessment System for Built Environment Efficiency (CASBEE) (version 2012)

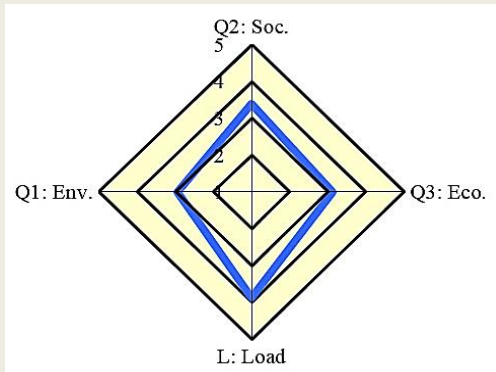
Conference on Aligning local interventions with the UN SDGs



Source: Kawakubo S, Murakami S, Ikaga T and Asami Y (2018). Sustainability assessment of cities: SDGs and GHG emissions, *Building Research & Information*, 46:5, 528-539, DOI: 10.1080/09613218.2017.1356120



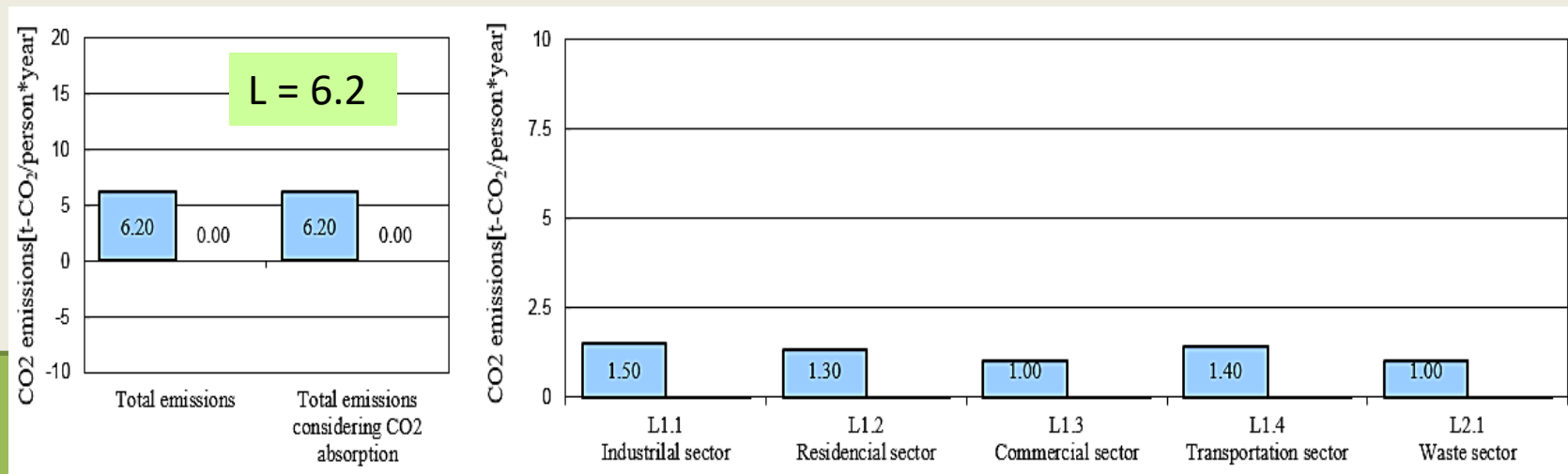
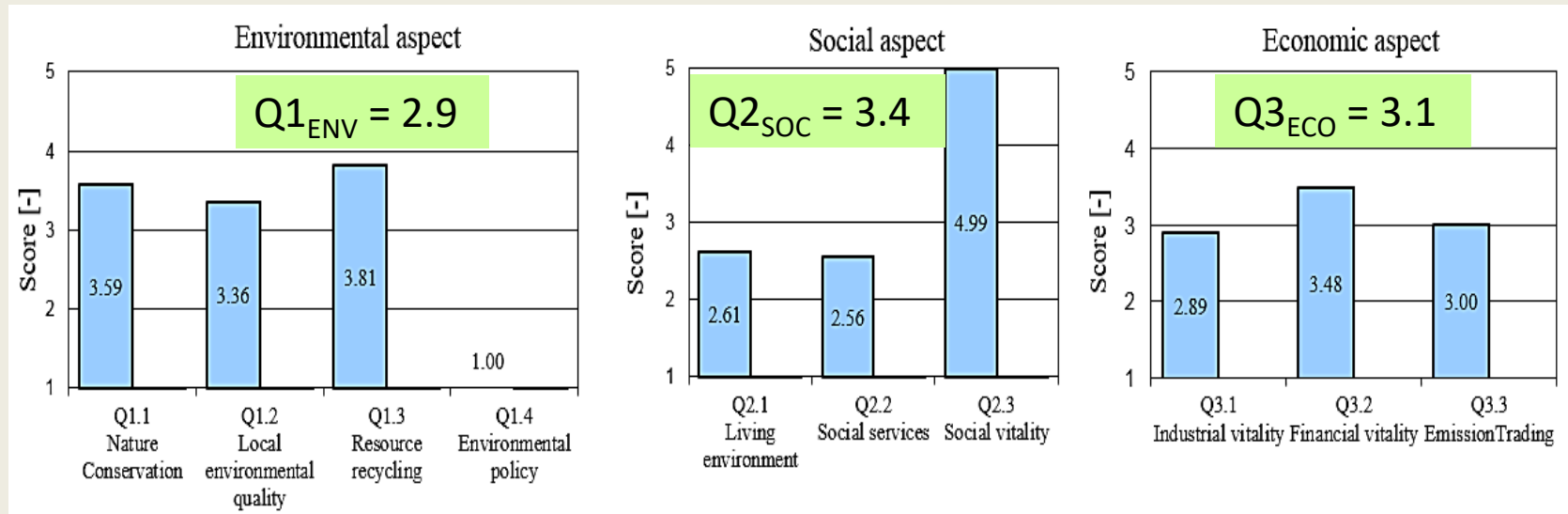
CASBEE indicators for Glasgow



Assessment items	value	unit	raw score
Q: Total score for Quality (0~100)			53.8
Q: Score for Quality (1.0~5.0)			3.2
Q1 Environmental aspect			2.94
Q1.1 Nature conservation			3.59
Q1.1.1 Ratio of green & water spaces	70.0	%	3.59
Q1.2 Local environmental quality			3.36
Q1.2.1 Air	0	days	5.00
Q1.2.2 Water	4.7	mg/l	1.72
Q1.3 Resource recycling			3.81
Q1.3.1 Recycling rate of general waste	25.2	%	3.81
Q1.4 CO₂ sinks			1.00
Q1.4.1 CO ₂ absorption by forests	0.0	t-CO ₂ /person	1.00
Q2 Social aspect			3.39
Q2.1 Living environment			2.61
Q2.1.1 Adequate quality of housing	104.0	m ²	3.09
Q2.1.2 Traffic safety	8.0	Num. of accidents /1000 people	1.37
Q2.1.3 Crime prevention	71.4	Num. of crimes /1000 people	1.00
Q2.1.4 Disaster preparedness	6.0	Num. of hospitals /100,000 people	4.99
Q2.2 Social service			2.56
Q2.2.1 Education service	13.5	person/person	2.88
Q2.2.2 Cultural service	1.0	Num. of facilities /10km ²	3.71
Q2.2.3 Medical service	1.0	person/1,000 people	2.54
Q2.2.4 Childcare service	0.2	Num. of facilities /100 people	1.27
Q2.2.5 Services for the elderly	0.4	Num. of facilities /10,000 people	2.42
Q2.3 Social vitality			4.99
Q2.3.1 Rate of population change due to births& deaths	2.0	%	5.00
Q2.3.2 Rate of population change due to migration	1.9	%	4.98
Q3 Economic aspect			3.12
Q3.1 Industrial vitality			2.89
Q3.1.1 Amount equivalent to gross regional product	3.2	1,000,000 Yen/person	2.89
Q3.2 Financial			3.48
Q3.2.1 Tax revenues	15.3	10,000/person	3.98
Q3.2.2 Outstanding local bonds	14.3	%	2.99
Q3.3 Emission trading			3.00
Q3.3.1 Amount of emission trading	N/A	-	3.00
L: Total score for Load (0~100)			28.4
L: Score for Load (1.0~5.0)			6.2
L1 CO₂ emissions from energy sources			
L1.1 Industrial sector	1.5	t-CO ₂ /person	
L1.2 Residential sector	1.3	t-CO ₂ /person	
L1.3 Commercial sector	1.0	t-CO ₂ /person	
L1.4 Transportation sectr	1.4	t-CO ₂ /person	
L2 CO₂ emissions from non energy sources			
L2.1 Waste disposal sector	1.0	t-CO ₂ /person	

CASBEE results for Glasgow

Conference on Aligning local interventions with the UN SDGs



Sustainability result for Glasgow

Conference on Aligning local interventions with the UN SDGs

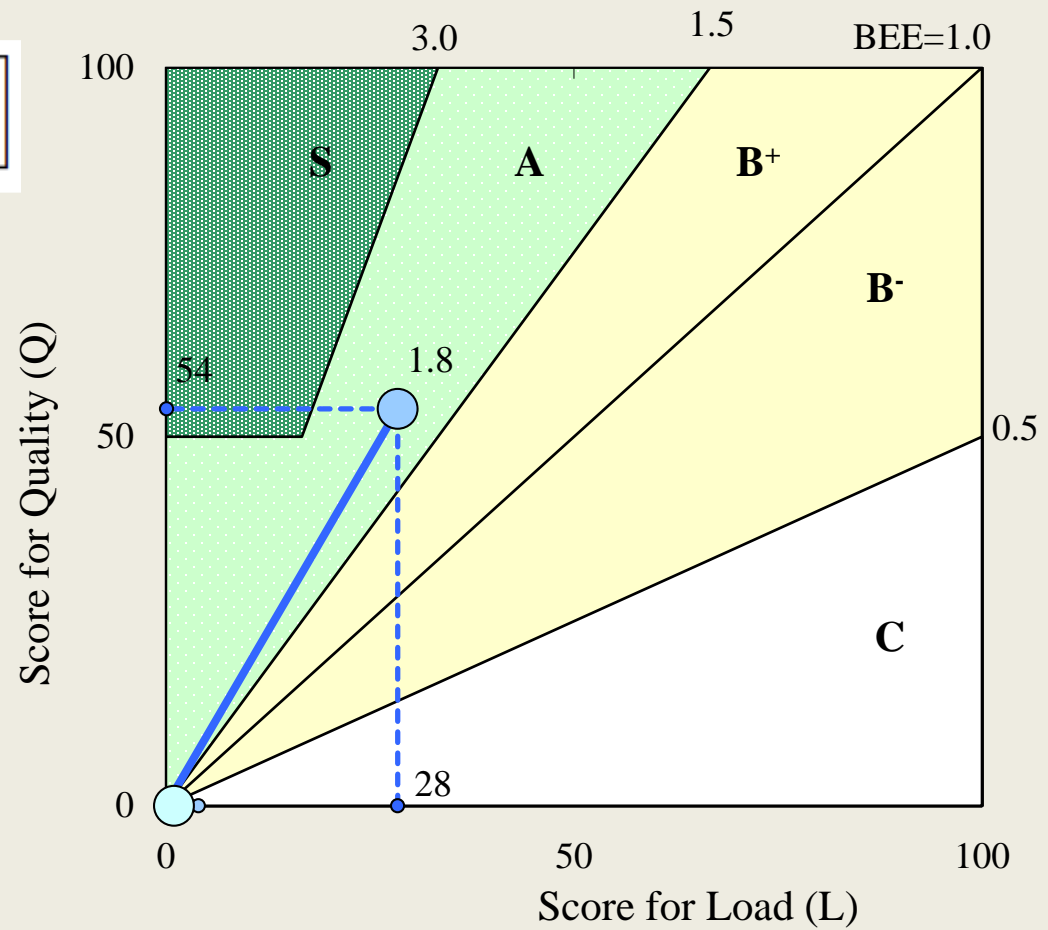
$$\text{Score for Quality} = 25 \cdot \left[\sum_i \left(\sum_j Q_{ij} \cdot w_{ij} \right) \cdot w_i - 1 \right]$$

$$Q_{\text{Glasgow}} = 54$$

$$\text{Score for Environmental Load} = 100 \times \frac{1}{1 + \exp(-a(\log_{10} x - \log_{10} m))}$$

$$L_{\text{Glasgow}} = 28$$

$$BEE_{\text{Glasgow}} = \frac{54}{28} = 1.8$$



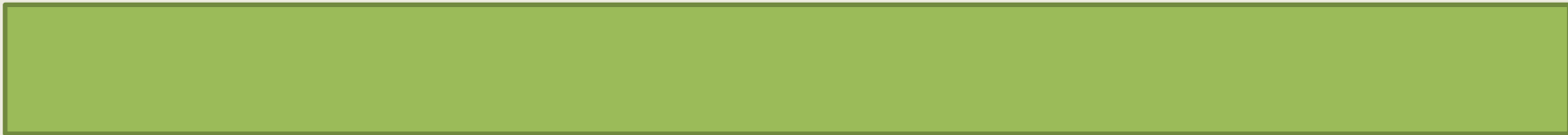
Recommendations

- Environment quality
 - Continuing projects such as Climate Ready Clyde
 - Increasing green spaces in the city
 - Measuring CO₂ absorption in urban green areas
- Social quality
 - Improving crime prevention: reducing inequalities in income and education
 - Improving road safety
 - Increasing facilities for social care, particularly for childcare
- Greenhouse gas emissions
 - Increase local electricity and heat generation with low carbon sources
 - Increase alternatives to reduce of diesel/petrol private cars use



Conclusions

- The BEE of Glasgow situates it as a relatively sustainable city
 - Good environmental, social and economic quality (Q = 54)
 - Low per capita GHG emissions (L=28)
- CASBEE is an adequate sustainability assessment tool to evaluate progress towards achieving SDG and Paris agreement goals
- Limitations of this study
 - Unavailability of data for some indicators
 - Weighting coefficients may need to be adapted to local context



Thank you for your attention!

