

Interreg
*M*editerranean



CESBA MED

Project co-financed by the European
Regional Development Fund

Un outil d'évaluation quartier durable européen

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26 octobre 2018, DREAL



**Auvergne
Rhône-Alpes**
Énergie Environnement



La Région
Auvergne-Rhône-Alpes



Origine



- CESBA: Common European Sustainable Built Environment – *a european Association*)
- Encourager l'utilisation d'outils régionaux/locaux (et donc contextualisés!) d'évaluation bâtiment durable, notamment pour les politiques publiques
- Besoin de parler un même langage autour d'un jeu limité d'indicateurs communs à tous les systèmes d'évaluation(KPIs) ➔
- En lien avec la démarche LEVEL(s) de l'UE

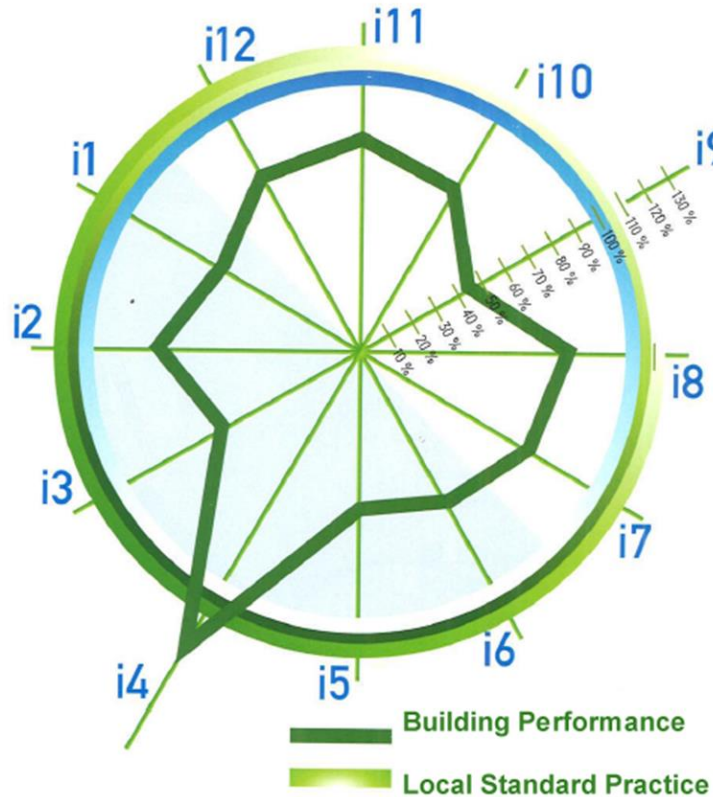


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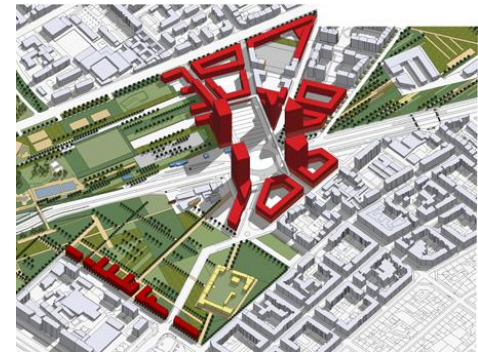
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Le « passeport » européen



Du bâtiment au quartier

- L'échelle du bâtiment pas tout le temps satisfaisante
- Besoin d'avoir une vue plus large, sur le quartier
- CESBA Med, pour poursuivre l'action d'harmonisation ET de contextualisation des outils d'évaluation, notamment pour les politiques publiques



Un outil basé sur la performance durable du quartier

- A travers des indicateurs quantitatifs
- A travers des critères sélectionnés parmi plus 200 indicateurs qui ont été recensés dans des outils existants en Europe
- Un outil qui permet de prioriser des actions
- Un outil qui donne un score final

Un outil excel!

- Formé de deux outils
- C'est plus facile à maintenir qu'un site web!
- Plus facile à prendre en main
- ...mais c'est un peu moins ...

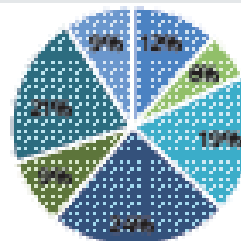
CRSMBD SM Tool

Place

2020/2021



Atmospheric emissions (t) = Gas of Function (t) + Heat of Function (t)



A B C D E F G

| | | | |
|--|---------------|--|-------|
| Number of indicators | 100 | Number of indicators | 100 |
| Number of indicators with a score of 100 | | Number of indicators with a score of 100 | 20 |
| Score | Average Score | | Score |

| | | | |
|---|-------------------------|-----|------|
| A | Built Urban Systems | 12% | 1,20 |
| B | Economy | 8% | 0,80 |
| C | Energy | 19% | 1,90 |
| D | Atmospheric emissions | 24% | 2,40 |
| E | Non-Renewable Resources | 15% | 1,50 |
| F | Environment | 21% | 2,10 |
| G | Security | 9% | 0,90 |

Weighted total score

100,0%

2,60

| KPIs Urban Scale | | TARGET | Unit of Measure | VALUE |
|------------------|---|--------|-----------------------------|-------|
| K07 | Conservation of land | 10% | % | 10% |
| K08 | Operating energy costs for public lighting | 60 | €/m²/year | 60 |
| C0.1 | Total final electricity energy consumption for buildings in operation | 20 | kWh/m²/year | 10 |
| C0.4 | Total final electricity energy consumption for buildings in operation | 15 | kWh/m²/year | 8 |
| C0.2 | Total final electricity energy consumption for buildings in operation | 80% | % | 80% |
| C0.1 | Share of renewable energy consumption for buildings in operation | 50% | % | 60% |
| C0.4 | Share of renewable energy consumption for buildings in operation | 70% | % | 60% |
| C0.7 | Share of electricity energy generated from renewable sources for buildings in operation | 60% | % | 70% |
| C0.8 | GHG emissions from energy use for public lighting in operation | 20 | kgCO ₂ e/m²/year | 18 |
| K0.6 | Consumption of gas for public lighting in operation | 15.0 | m³ per m²/year | 15.0 |
| K0.7 | Consumption of gas for public lighting in operation | 10 | m³ per m²/year | 8 |
| K09 | Built areas from construction and demolition projects related to the renovation of the urban fabric | 60% | % | 70% |
| K10 | Consumption of water and wastewater treatment for the renovation of the urban fabric | 10.0 | (m³/m²/year) (m³/m²/year) | 10.0 |
| F0.0 | Percentage of green spaces in the urban fabric | 60% | % | 70% |
| F0.0 | Percentage of green spaces in the urban fabric | 15 | % | 10.0 |
| C0.0 | Performance of the public transport system | 70% | % | 60% |
| C0.0 | Quality of public transport system | 7 | km/1000 inhabitants | 6 |
| C0.0 | Availability of public transport system | 60% | % | 70% |

Comment ça marche?

- Sélection des critères et des indicateurs liés dans les 7 thématiques:
 - Système urbain,
 - Economie,
 - Energie,
 - Emissions,
 - Ressources non renouvelables,
 - Environnement,
 - Social



Key Performance Indicators

- Recommandations de ne pas choisir plus d'une trentaine d'indicateurs
- Parmi ces indicateurs, un certain nombre sont obligatoire: les Key Performance Indicators (KPIs)

Liste des KPIS

- A 1.7 Préservation des terres naturelles et agricoles
- B.3.3 Dépenses énergétiques des bâtiments publics en phase usage
- C.1.1 Consommation totale d'énergie thermique dans les bâtiments
- C.1.4 Consommation totale d'énergie électrique dans les bâtiments
- C.1.7 Consommation totale d'énergie primaire des bâtiments
- C.2.1 Part de la production thermique locale d'origine renouvelable dans les consommations finales d'énergie thermique
- C.2.7 Part de la production locale d'électricité d'origine renouvelable dans la consommation totale d'électricité
- D.1.2 Emissions totales de GES dues aux consommations d'énergie dans le bâtiment en phase usage

Liste des KPIS (suite)

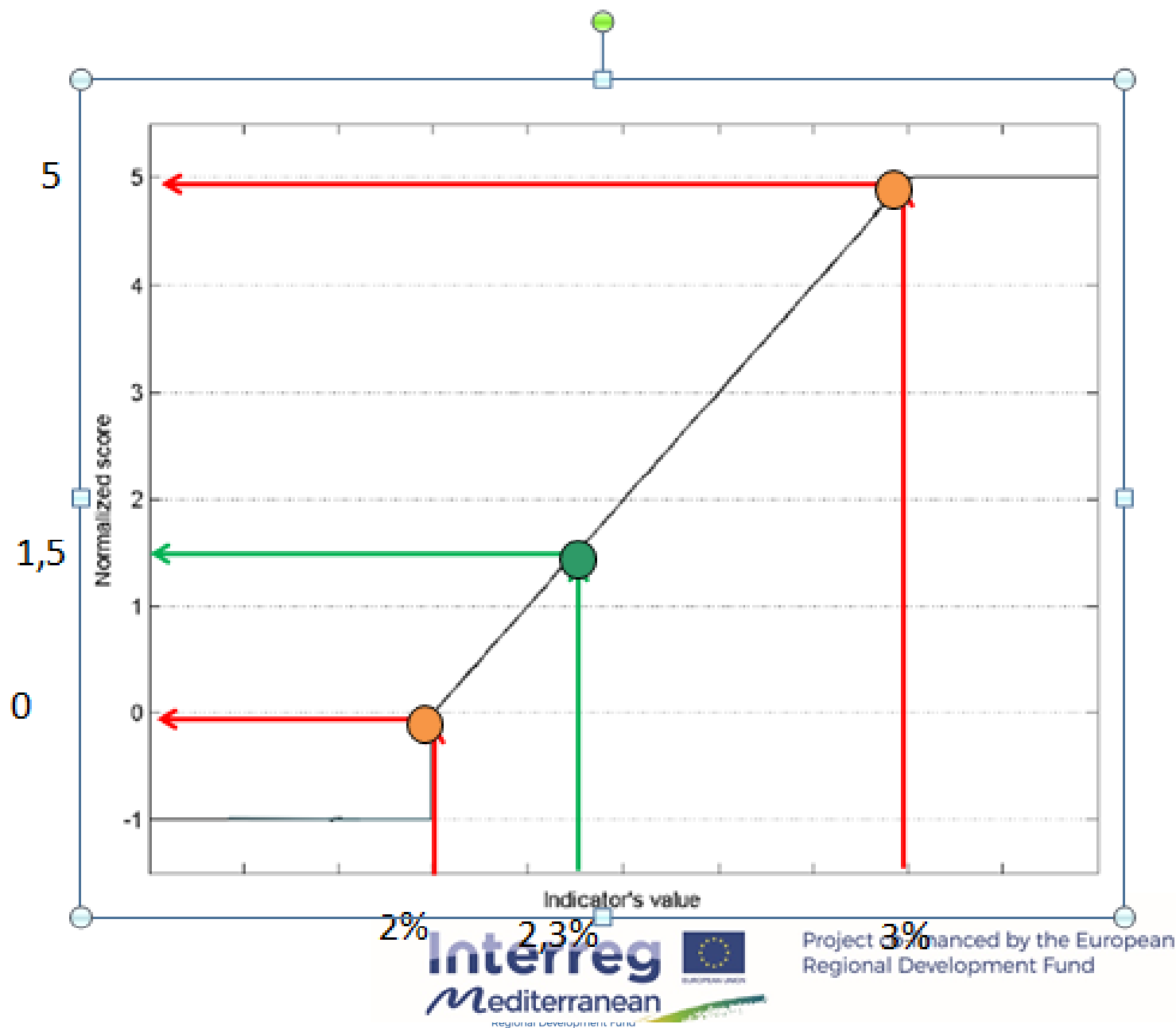
- E.1.6 Consommation d'eau du secteur résidentiel
- E.1.7 Consommation d'eau potable des bâtiments non résidentiels
- F.1.3 Recharge des nappes via la perméabilité ou l'aménagement paysager
- F.2.3 Qualité de l'air relatif à la concentration en particules $<10 \mu\text{m}$ (PM10) sur une année
- G.2.1 Performance des transports publics
- G.2.4 Qualité des réseaux piétons et cyclable
- G.4.2 Disponibilité et proximité des services et équipements du quotidien
- G.6.3 Participation des habitants et usagers dans les opérations d'aménagement

Le poids des critères

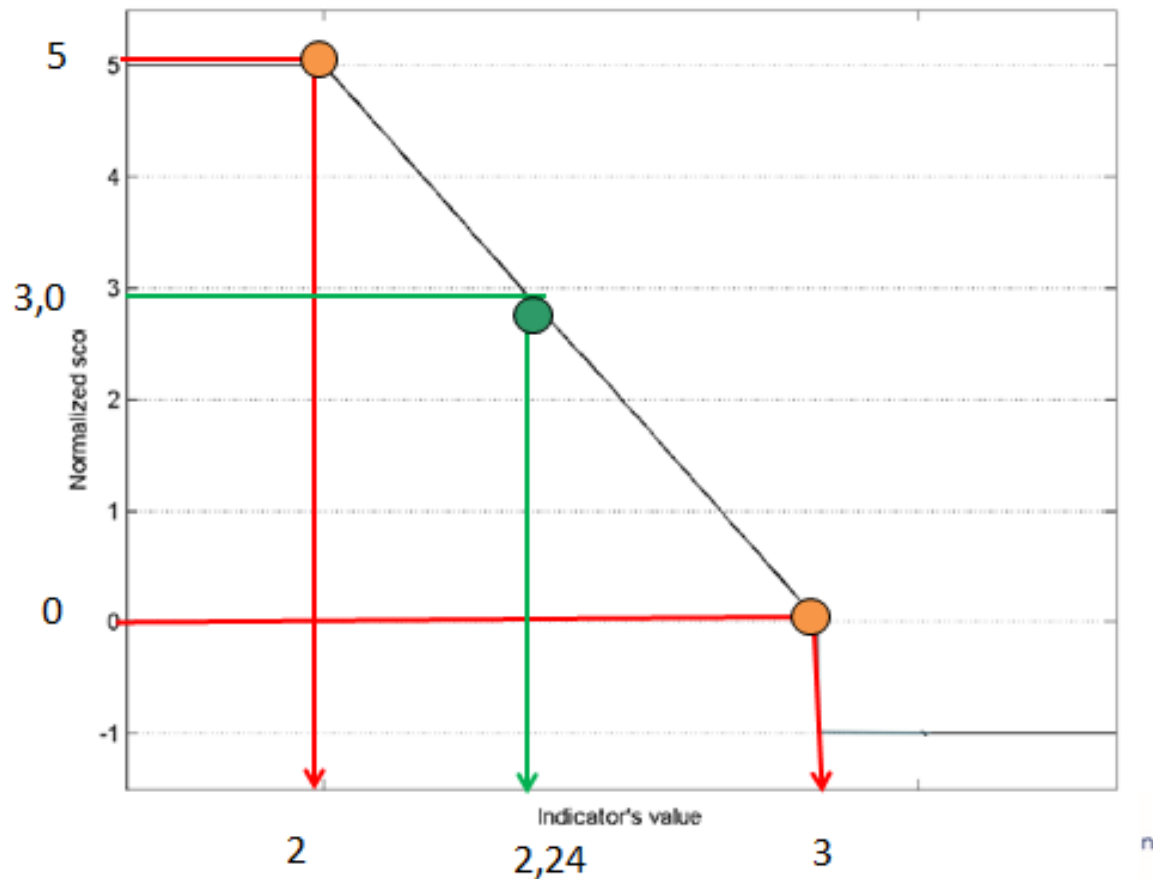
- Une fois les critères choisis, on leur donne un poids
 - Ex: la thématique énergie est importante, je lui donne 40% de la valeur totale des points.
 - Dans cette catégorie énergie, si j'ai choisi plusieurs critères, je leur donne un poids à eux aussi.
- Le poids de chaque critère est profondément subjectif et politique!

La normalisation

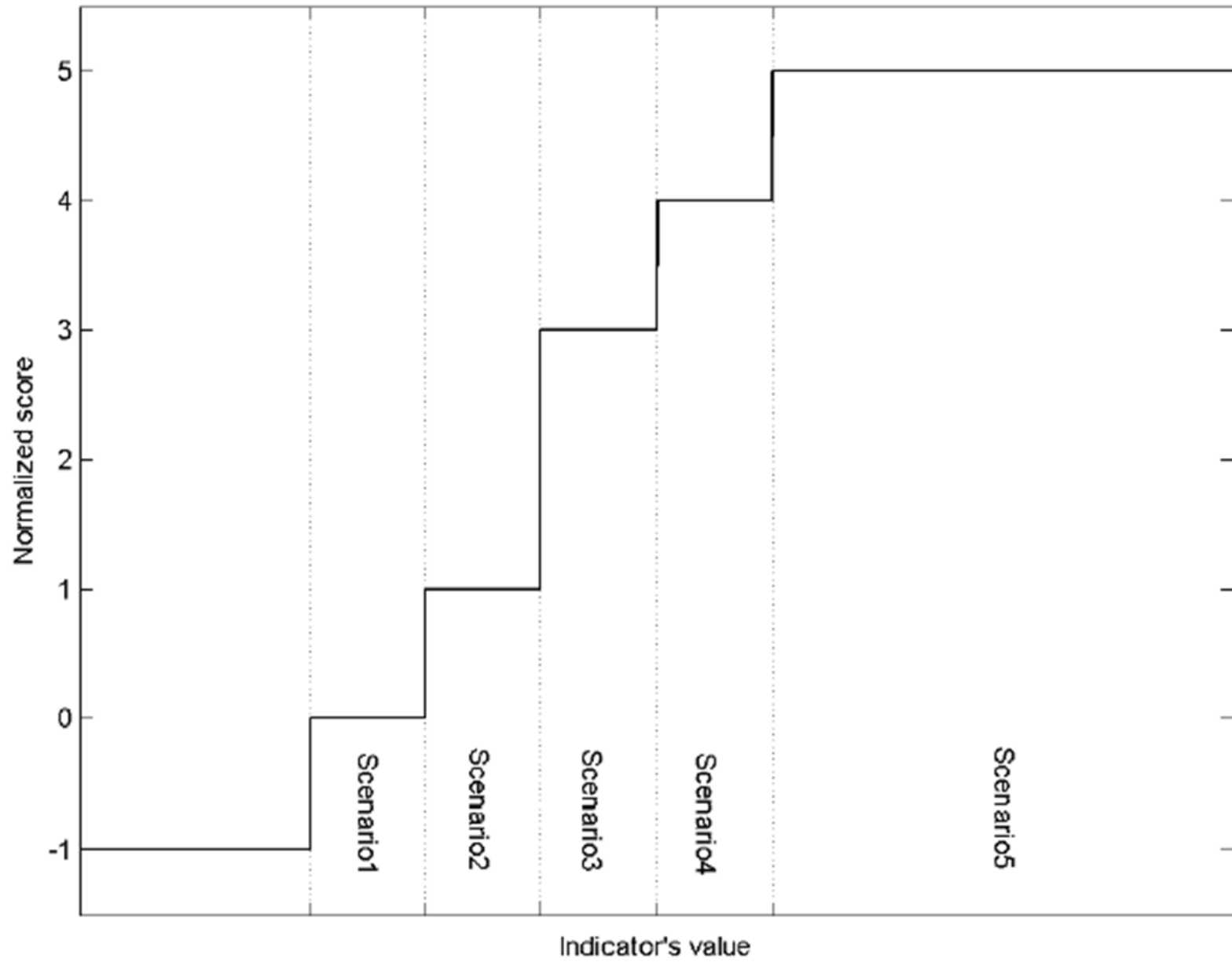
- Pour donner une « note » au critère, et pouvoir ensuite additionner ces notes (et donc additionner des KWh/m² avec des % de matériaux recyclés), on passe par l'étape de normalisation qui consiste à:
 - Faire un benchmark pour avoir le minimum acceptable et la meilleure pratique
 - Et ensuite positionner son projet par rapport à ce benchmark



Exemple (consommation énergie)



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Aggrégation:

Critère

Poids

Catégorie

Poids

Thématique

Poids

| | |
|--|-----|
| B1.1 - Energia primaria non rinnovabile contenuta nei materiali da costruzione | 25% |
| B1.2 - Energia primaria operativa non rinnovabile consumata dall'edificio | 75% |

| | |
|--|-----|
| B1 - Energia totale non rinnovabile consumata lungo il ciclo di vita | 35% |
|--|-----|

| | |
|--|-----|
| B2 - Picco di domanda di energia elettrica operativa dell'edificio | 15% |
|--|-----|

| | |
|--|-----|
| B3.1 - Uso di energia prodotta da fonti rinnovabili esternamente al sito | 33% |
| B3.2 - Uso di energia prodotta da fonti rinnovabili internamente al sito | 67% |

| | |
|--------------------------|-----|
| B3 - Energia rinnovabile | 15% |
|--------------------------|-----|

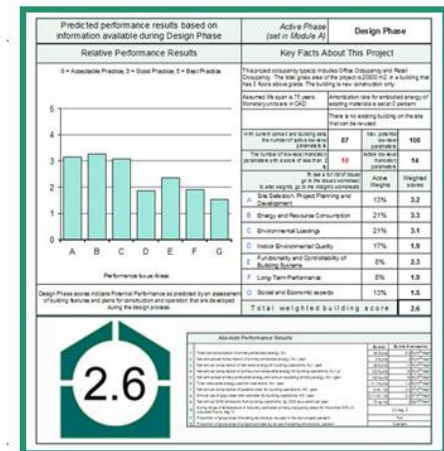
| | |
|--|-----|
| B5.1 - Recupero di strutture esistenti | 26% |
| B5.2 - Riutilizzo dei materiali recuperati | 11% |
| B5.3 - Uso di materiali riciclati da fonti esterne al sito | 6% |
| B5.4 - Uso di prodotti biocompatibili ottenuti da processi sostenibili | 11% |
| B5.5 - Uso di cementi alternativi nel calcestruzzo | 26% |
| B5.6 - Uso di materiali prodotti localmente | 11% |
| B5.7 - Smontaggio, recupero e riciclo | 9% |

| | |
|----------------|-----|
| B5 - Materiali | 20% |
|----------------|-----|

| | |
|--|-----|
| B6.2 - Requisiti progettuali e piani di gestione per limitare l'uso di acqua potabile per l'irrigazione | 50% |
| B6.3 - Requisiti progettuali e piani di gestione per limitare l'uso di acqua potabile per gli impianti e le necessità degli utenti | 50% |

| | |
|---------------------|-----|
| B6 - Acqua potabile | 15% |
|---------------------|-----|

| | |
|--|-----|
| A Impatto sul sito | 13% |
| B Consumo di risorse | 21% |
| C Carichi ambientali | 21% |
| D Qualità dell'ambiente indoor | 17% |
| E Efficienza distributiva e tecnologica | 8% |
| F Gestione e performance nel lungo termine | 8% |
| G Aspetti socio-economici | 13% |



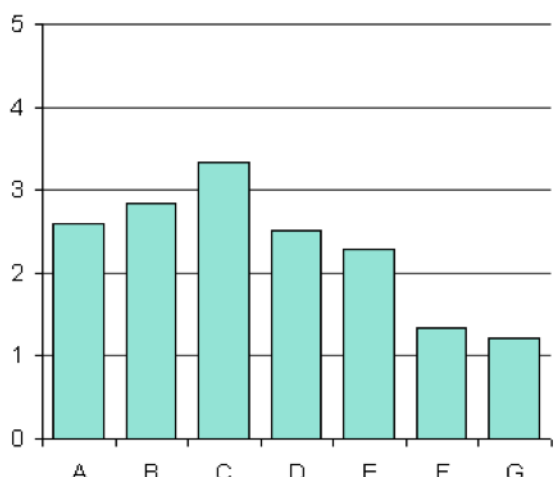
Les KPIs : performance en valeur absolue

Absolute Performance Results

| | | By area | By area & occupancy |
|----|--|--------------------------------------|---|
| 1 | Total net consumption of primary embodied energy, GJ | 2,1 GJ/m ² | 0,1 GJ/m ² maph |
| 2 | Net annualized consumption of primary embodied energy, MJ / year | 28 MJ/m ² | 2 MJ/m ² maph |
| 3 | Net annual consumption of delivered energy for building operations, MJ / year | 79 MJ/m ² | 5 MJ/m ² maph |
| 4 | Net annual consumption of primary non-renewable energy for building operations, MJ / yr. | 93 MJ/m ² | 6 MJ/m ² maph |
| 5 | Net annualized primary embodied energy and annual operating primary energy, MJ / year | 121 MJ/m ² | 8 MJ/m ² maph |
| 6 | Total renewable energy used for operations, MJ / year | 11,1 MJ/m ² | 0,7 MJ/m ² maph |
| 7 | Net annual consumption of potable water for building operations, m ³ / year | 0,3 m ³ / m ² | 0,0 m ³ /m ² maph |
| 8 | Annual use of grey water and rainwater for building operations, m ³ / year | 0,11 m ³ / m ² | 0,0 m ³ /m ² maph |
| 9 | Net annual GHG emissions from building operations, kg. CO ₂ equivalent per year | 16 kg./m ² | 1 kg/m ² maph |
| 10 | Swing range of temperature in naturally ventilated primary occupancy areas for more than 90% of occupied hours, deg. C | 2.2 deg. C | |
| 11 | Proportion of gross area of existing structure(s) re-used in the new project, percent | N.A. | |
| 12 | Proportion of gross area of project provided by re-use of existing structure(s), percent | 0 percent | |

Score final

2.6

| Predicted performance results based on information available during Design Phase | Active Phase (set in Module A) | Design Phase | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|----------------|------------|--------|----------------|--|----|-----|-----------------------------------|-----|-----|--------------------------|-----|-----|--------------------------------|-----|-----|---|----|-----|-------------------------|-----|-----|-------------------------------|----|-----|--------------------------------------|--|------------|
| Relative Performance Results | Key Facts About This Project | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>0 = Acceptable Practice; 3 = Good Practice; 5 = Best Practice</p>  <p>Performance Issue Areas</p> | <p>This project occupancy type(s) includes Office Occupancy and Retail Occupancy. The total gross area of the project is 20800 m2, in a building that has 3 floors above grade. The building is new construction only.</p> <p>Assumed life span is set at 75 years</p> <p>Amortization rate for embodied energy of existing materials is set at 0 percent.</p> <p>There is no existing building on the site that can be re-used</p> <p>With current context and building data, the number of active low-level parameters is: 73</p> <p>Max. potential low-level parameters: 85</p> <p>The number of low-level mandatory parameters with a score of less than 3 is: 15</p> <p>Active low-level mandatory parameters: 25</p> <p>To see a full list of issues go to the Issues worksheet; to alter weights, go to the weights worksheets.</p> <p>Active Weights</p> <p>Weighted scores</p> <table border="1"> <thead> <tr> <th>Issue Area</th> <th>Weight</th> <th>Weighted Score</th> </tr> </thead> <tbody> <tr> <td>A Site Selection, Project Planning and Development</td> <td>9%</td> <td>2,6</td> </tr> <tr> <td>B Energy and Resource Consumption</td> <td>21%</td> <td>2,8</td> </tr> <tr> <td>C Environmental Loadings</td> <td>23%</td> <td>3,3</td> </tr> <tr> <td>D Indoor Environmental Quality</td> <td>22%</td> <td>2,5</td> </tr> <tr> <td>E Functionality and Controllability of Building Systems</td> <td>7%</td> <td>2,3</td> </tr> <tr> <td>F Long-Term Performance</td> <td>11%</td> <td>1,3</td> </tr> <tr> <td>G Social and Economic aspects</td> <td>5%</td> <td>1,2</td> </tr> <tr> <td>Total weighted building score</td> <td></td> <td>2,6</td> </tr> </tbody> </table> | | Issue Area | Weight | Weighted Score | A Site Selection, Project Planning and Development | 9% | 2,6 | B Energy and Resource Consumption | 21% | 2,8 | C Environmental Loadings | 23% | 3,3 | D Indoor Environmental Quality | 22% | 2,5 | E Functionality and Controllability of Building Systems | 7% | 2,3 | F Long-Term Performance | 11% | 1,3 | G Social and Economic aspects | 5% | 1,2 | Total weighted building score | | 2,6 |
| Issue Area | Weight | Weighted Score | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A Site Selection, Project Planning and Development | 9% | 2,6 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B Energy and Resource Consumption | 21% | 2,8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C Environmental Loadings | 23% | 3,3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D Indoor Environmental Quality | 22% | 2,5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E Functionality and Controllability of Building Systems | 7% | 2,3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F Long-Term Performance | 11% | 1,3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G Social and Economic aspects | 5% | 1,2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total weighted building score | | 2,6 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Design Phase scores indicate Potential Performance as predicted by an assessment of building features and plans for construction and operation that are developed during the design process. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Les 4 étapes



- Choix des indicateurs



- Normalisation



- Aggregation



- Score final

Prochaines étapes

- Test des KPIs sur des sites pilotes
- Concours européen quartiers durables:
 - Valoriser vos projets
 - Fiabiliser ces KPIs
 - Faire partie d'une démarche européenne
- <https://www.cesba.eu/>
- Contact:
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jcazas@envirobatbdm.eu

