**Table 1**

Environmental Indicators on the Adoption of Vehicles

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HTI | LTI | Electric vehicle | | | Conventional vehicle (CV) | | | Weight | Unit | Environment Indicators |
| HEV | FCEV | EV | Diesel | CNG | Gasoline |
| 0.01 | 1.81 | 0.3 | 0.1 | 0.01 | 0.63 | 0.96 | 1.81 | 0.169 | gr/km | EN1 |
| 0.001 | 0.33 | 0.01 | 0.003 | 0.001 | 0.33 | 0.2 | 0.1 | 0.171 | gr/km | EN2 |
| 2 | 242 | 50 | 12 | 2 | 185 | 212 | 242 | 0.162 | gr/km | EN3 |
| 10 | 4 | 6 | 3 | 4 | 10 | 9 | 10 | 0.168 | year | EN4 |
| 65 | 85 | 68 | 65 | 65 | 80 | 75 | 70 | 0.166 | dB | EN5 |
| 40 | 65 | 60 | 55 | 65 | 47 | 45 | 40 | 0.164 | % | EN6 |

**Table 2**

Economic Indicators on the Adoption of Vehicles

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HTI | LTI | Electric vehicle | | | Conventional vehicle (CV) | | | Weight | Unit | Economic Indicators |
| HEV | FCEV | EV | Diesel | CNG | Gasoline |
| 4000 | 40000 | 35000 | 40000 | 25000 | 20000 | 10000 | 4000 | 0.167 | $ | EC1 |
| 250 | 2000 | 1500 | 2000 | 1200 | 600 | 500 | 250 | 0.164 | $/year | EC2 |
| 3 | 40 | 7 | 40 | 3 | 25 | 20 | 35 | 0.171 | cents/ liter | EC3 |
| 5 | 0 | 1 | 0 | 1 | 3 | 4 | 5 | 0.174 | number | EC4 |
| 100 | 1000 | 700 | 1000 | 900 | 100 | 100 | 100 | 0.161 | $/year | EC5 |
| 10 | 1 | 6 | 3 | 4 | 7 | 8 | 10 | 0.163 | year | EC6 |

**Table 3**

Social Indicators on the Adoption of Vehicles

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HTI | LTI | Electric vehicle | | | Conventional vehicle (CV) | | | Weight | Unit | Social Indicators |
| HEV | FCEV | EV | Diesel | CNG | Gasoline |
| 0.4 | 0.9 | 0.9 | 0.7 | 0.9 | 0.4 | 0.4 | 0.4 | 0.211 | number/ million people | SO1 |
| 0.9 | 0.2 | 0.3 | 0.2 | 0.3 | 0.8 | 0.8 | 0.9 | 0.197 | % | SO2 |
| 75 | 18 | 33 | 30 | 25 | 45 | 40 | 35 | 0.194 | years | SO3 |
| 0.9 | 0.1 | 0.9 | 0.9 | 0.9 | 0.3 | 0.2 | 0.1 | 0.202 | person/year | SO4 |
| 1600 | 900 | 1600 | 1500 | 1300 | 1100 | 1200 | 1000 | 0.196 | kg | SO5 |

**Table 4**

Technical Indicators on the Adoption of Vehicles

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HTI | LTI | Electric vehicle | | | Conventional vehicle (CV) | | | Weight | Unit | Technology Indicators |
| HEV | FCEV | EV | Diesel | CNG | Gasoline |
| 1 | 0 | 0.1 | 0 | 0.1 | 0.7 | 0.9 | 1 | 0.141 | % | TE1 |
| 5 | 60 | 25 | 60 | 30 | 5 | 10 | 5 | 0.146 | min | TE2 |
| 0.55 | 0.4 | 0.55 | 0.5 | 0.4 | - | - | - | 0.140 | % | TE3 |
| 0.6 | 0.38 | 0.6 | 0.5 | 0.38 | - | - | - | 0.138 | % | TE4 |
| 60 | 30 | 35 | 60 | 30 | 40 | 40 | 35 | 0.143 | % | TE5 |
| 80 | 150 | 150 | 140 | 130 | 90 | 100 | 80 | 0.145 | KW/KG | TE6 |
| 136 | 1 | 2 | 1 | 2 | 14 | 19 | 136 | 0.147 | Number | TE7 |

**Table 5**

Critical indicators and appropriate policies

|  |  |  |  |
| --- | --- | --- | --- |
| Policy description | Policy | Description | Indicators |
| Smaller EV designs | P1 | Vehicle size | SO5 |
| Use of a new generation of batteries in EV | P2 | Cost of the battery | EC5 |
| Increase EV number | P3 | CO2 emission | EN3 |
| EV charging management | P4 | power losses | TE4 |

**Table 6**

**Rating of alternative policy strategies by decision-makers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EN** | **SO** | **EC** | **TE** | **Criteria** |
| **VH** | **M** | **M** | **L** | **Weight of criteria** |
| VH | M | M | L | **P1** |
| VL | VL | VH | M | **P2** |
| VH | M | L | L | **P3** |
| VL | VL | H | VH | **P4** |

**Table 7**

The distance from the positive ideal value

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TE** | **EC** | **SO** | **EN** | **Policy scenarios** | |
| 20.6388 | 2.4885 | 4.7273 | 3.8474 | 9.5756 | **P1** | |
| 20.9406 | 2.2441 | 3.3853 | 5.7357 | 9.5756 | **P2** | |
| 16.1848 | 2.4885 | 5.5258 | 3.8474 | 4.323 | **P3** | |
| 21.167 | 1.8572 | 3.9986 | 5.7357 | 9.5756 | **P4** |

**Table 8**

The distance from the negative ideal value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **TE** | **EC** | **SO** | **EN** | **Policy scenarios** |
| 9.0403 | 0.7423 | 2.6948 | 4.2346 | 1.3687 | **P1** |
| 8.5029 | 1.0757 | 4.5648 | 1.4938 | 1.3687 | **P2** |
| 14.237 | 0.7423 | 1.7938 | 4.2346 | 7.4664 | **P3** |
| 8.2463 | 1.7597 | 3.6242 | 1.4938 | 1.3687 | **P4** |

**Table 9**

The similarity to the ideal option ()

|  |  |  |
| --- | --- | --- |
| **Ranking** |  | **Policy scenarios** |
| 2 | 0.3046 | **P1** |
| 3 | 0.2888 | **P2** |
| 1 | 0.468 | **P3** |
| 4 | 0.2804 | **P4** |

**Table 10**

Ranking of policy scenario utilizing the VIKOR method

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ranking** | **Policy scenarios** | **Si** | **Ri** | **Q** |
| 1 | P3 | 5.000 | 5.000 | 0.0000 |
| 2 | P1 | 6.667 | 5.000 | 0.0806 |
| 3 | P2 | 15.000 | 9.000 | 0.9839 |
| 4 | P4 | 15.333 | 9.000 | 1.0000 |