**Learning scenario with MARG - Template**

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| PART 1: General information  |
| Title of the scenario: | Renew Go |
| Keywords: | Energy transition, decent work and economic growth, sustainable cities and communities  |
| Name(s) of the scenario’s creator(s): | Giel Bakker, Merlijn Boven, Sven Dik, Stein Reintke (HAVO-4 students) |
| Creative Commons License of the scenario: | [ ] Attribution | [ ] Attribution-NoDerivs |
| [ ] Attiribution-ShareAlike | [ ] Attribution-NonCommercial |
| [X] Attribution-NonCommercial-ShareAlike | [ ] Attribution-NonCommercial-NoDerivs |
| Estimated duration of the scenario’s activities: | 2 hours |
| Age range of learners: | 12 to 14 years  |
| Learners’ special characteristics: (i.e. immigrants, special needs) | none |
| Learning subject based on your curriculum to which the scenario relates: | Economics, chemistry, biology, social science  |
| To which Sustainable Development Goal (s) does the scenario relate to : (highlight it/them) | [ ] No Poverty | [ ] Industry, Innovation and infrastructure |
| [ ] Zero Hunger | [ ] Reduced Inequalities |
| [ ] Good Health and Well-Being | [X] Sustainable Cities and Communities |
| [ ] Quality Education | [ ] Responsible Consumption and Production |
| [ ] Gender Equality | [ ] Climate Action |
| [ ] Clean Water and Sanitation | [ ] Life Below Water |
| [X] Affordable and Clean Energy | [ ] Life On Land |
| [X] Decent Work and Economic Growth | [ ] Peace, Justice and Strong Institutions |
|  | [ ] Partnerships For The Goals |
| Which 21st century skill(s) does the scenario involve:(highlight it/them) | [ ] Information and data literacy  | [ ] Critical thinking,  |
| [ ] Communication | [ ] Active citizenship |
| Collaboration | Respect for differences |
| Problem solving |  |
| PART 2: Learning outcomes of the scenario  |
| In terms of knowledge  | The learner knows and understands:* What sustainably means
* The impact of their choices regarding sustainability on the environment
* Consequences of their choices in the future
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| In terms of skills | The learner is able to:* Collaborate with the teammates, answer the questions in each step and make choices
* Consider several elements at the same time in making a choice, i.e., happiness, CO2 level, and monthly income
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| In terms of competences | The learner:* Will be able to live energy conscious
* Will contribute to CO2 emission reduction
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| PART 3: Description of the game |
| Narrative description of the game plot: | The player is a mayor of a city. During the game the player will cycle a route through the city, stopping at various locations at which the player has to make a choice to make his/her city more sustainable. At these locations the player will receive information that can influence his/her decision. While playing the game, the players has to take the CO2 factor into account. This CO2 factor starts at 80% and increases with 1% every month (which equals five minutes in the game). (For an explanation, see the block CO2 level below). During the game, there are various factors players should take into account. An overview of these factors can be found under ‘Important game objects’.  |
| Game objectives: | The players, in the role of the city major, have to make the right choices to make his/her city more sustainable. |
| Does the scenario refer to a specific location? If yes, specify. If no, write everywhere. | Yes, the cycle route goes through Assen (a city in the North of the Netherlands). |
| Characters: | Dave is an introductory robot. He introduces the player to the game and to the element that come into play. Moreover he provides information about sustainability, to help the player to make their sustainable choices during the game. Bram is the boss of the player. He monitors every choice of the player. During the game the CO2 level and the happiness level will change and once they are dangerously low or high, the boss will warn the player. When the CO2 level is at a 100 percent or the happiness level is at zero, Bram, the boss, will come and fire the player and it is GAME OVER. Besides these warnings, the boss is not an active element in the game itself. There are various advisers. They can be found on various locations in the game. Once the player has reached a certain adviser, the adviser will ask questions to the player that he or she needs to answer.  |
| Scenes: | 1. de Bonte Wever (Name of the location)2.Drentsche Golf & Country Club3.Asserbos 4.Stadsbedrijvenpark Ketellapper 5.F.C. Amboina  |
| Type of work: Individual/ collaboration | Collaboration |
| Does the game involve different player roles? If yes, specify. | No, the player only plays the mayor of Assen.  |

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| PART 4: Description of the learning scenario activities |
|  | **Learning settings** | **Estimated time** |
| Before the game: | The subject of global warming is brought up in the class, and students discuss for a few minutes in groups how CO2 emission could keep heat in the atmosphere and why is it not good for the environment. This discussion will make them motivated to go further and start the game.The game objectives are introduced to the students in a witten or an oral format. Students are instructed to download the app on their phone and play the MARG. Additionally they are divided into teams to play the game.  | 30’ |
| During the game: | During the game the player will cycle a route through the city, stopping at various locations at which the player has to make a choice to make his/her city more sustainable. At these locations the player will receive information that can influence his/her decision. The question and the options at each scene were explained in the earlier sections. During the game the CO2 level and the happiness level will change and once they are dangerously low or high, the player is warned.When the CO2 level is at a 100 percent or the happiness level is at zero, Bram, the boss, will come and fire the player and it is GAME OVER.More specifically the players will visit the following locations:**1. de Bonte Wever** (Name of the location)Question: What do you do with the parking spaces of the Bonte Wever? Option 1: The player keeps them. Effects: • Happiness: remains the same • CO2 level: remains the same • Money: remains €0• Monthly income: €0Option 2: The player makes half of the car parking spaces specifically for electric vehicles. Effects: • Happiness: - 5 %• CO2 level: -2 % • Money: - € 150.000,00• Monthly income: €0Option 3: The player replaces half of the car parking spaces for bicycle shedsEffects: • Happiness: +5%• CO2 level: -2%• Money: - € 20.000,00• Monthly income: €0**2.Drentsche Golf & Country Club** Question: What are you doing with the golf course? Option 1: The player leaves the golf course as it is. Effects: • Happiness: remains the same • CO2 level: remains the same • Money: + €50.000• Monthly income: €0Option 2: The player replaces half the golf course with a new forest. • Happiness: - 3%• CO2 level: - 5%• Money: - €10.000,00• Monthly income: - €500Option 3: The player replaces the golf course by a solar panel field. • Happiness: -10% • CO2 level: -5%• Money: - €50.000,00• Monthly income: + €750**3.Asserbos** Question: What are you doing with the forest? Option 1: The player replaces the forest with facilities. Effects: • Happiness: +10 %• CO2 level: + 7.5% • Money: remains -€200.000,00• Monthly income: - €2000Option 2: The player cuts the current trees and replace them with new treesEffects: • Happiness: -2% • CO2 level: -5 % • Money: - €25.000• Monthly income: Remains the sameOption 3: The player leaves the forest for what it is. Effects: • Happiness: remains the same • CO2 level: remains the same • Money: remains the same• Monthly income: remains the same**4.Stadsbedrijvenpark Ketellapper** Question: What do you do with the industrial estate? Option 1: The player decides to leave this estate as it is. Effects: • Happiness: remains the same • CO2 level: remains the same • Money: remains the same• Monthly income: remains the same Option 2: The player decides to install green roofs on all the buildings. Effects: • Happiness: -5% • CO2 level: -10% • Money: - €2.000• Monthly income: Remains the sameOption 3: The player decides to install solar panels on the roofs. Effects: • Happiness: Remains the same. • CO2 level: -20 % • Money: - €10.000• Monthly income: Remains the same**5.F.C. Amboina** Question: What do you do with the local football club? Option 1: The player replace s the football club and all its facilities with windmills. Effects: • Happiness: -10% • CO2 level: -10% • Money: - €200.000• Monthly income: -€3.500Option 2: The player removes the football club and all its facilities and replaces it with a solar panel field. Effects: • Happiness: -5% • CO2 level: -5 % • Money: - €50.000• Monthly income: -€750Option 3: The leaves the football club for what it is. Effects: • Happiness: Remains the same • CO2 level: Remains the same • Money: Remains the sameMonthly income: Remains the same | 120’ |
| After the game: | Player will return to their school and discuss their decisions with the rest of the class. | 30’ |
|  | **Total**: | 180’ |

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| PART 5: Prerequisite knowledge and supportive material |
| Learners’ prerequisite knowledge: | Basic knowledge of the global warming phenomenon. |
| Infrastructure/ equipment needed for implementing the scenario: | Mobile devices, wireless internet connection |
| Other learning resources needed: |  |

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| PART 6: Approach towards the assessment of the learning outcomes |
| Learners’ assessment approach: | After the completion of the game, learning outcomes will be assessed through a questionnaire and oral feedback from the students. |

## Informatiebronnen

 Google Maps Assen - https://www.google.com/maps/place/Assen/@52.9836327,6.4789098,12z/data=!3m1!4b1!

4m5!3m4!1s0x47c824c1cf7ae1b1:0xc350e413be5175c3!8m2!3d52.992753!4d6.5642284

  Encyclo.nl - https://www.encyclo.nl/begrip/duurzaamheid

  Wibnet.nl - https://wibnet.nl/natuur/klimaatverandering/wat-stoot-het-meeste-co2-uit

  Milieucentraal.nl - https://www.milieucentraal.nl/energie-besparen/zonnepanelen

  Biologie voor Jou – Schoolboek

 Erasmus+ - https://ec.europa.eu/programmes/erasmus-plus/about\_nl   RIVM.nl – Informatie over duurzaamheid & gezondheid.

 Urgenda.nl - https://www.urgenda.nl/themas/klimaat-en-energie/klimaatvragen/watgebeurt-er-als-de-aarde-met-4-graden-

opwarmt/#:~:text=GEVOLGEN%20VAN%204%20GRADEN%20OPWARMING&text=Enkele%20 gevolgen%3A%20sterfte%20door%20hitte,zowel%20meer%20overstromingen%20als%20dro ogtes

  GitHub Pagina - https://github.com/SkeletonTechNL/Renew-Go

  NameCheap Logo Maker - https://www.namecheap.com/logo-maker/

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| **Object**  | **Afbeelding** |
| Coins Coins can be used as a means of payment. They can be earned by making certain decisions regarding the sustainability of the city. Each month (each five minutes) the players gets ten thousand coins. This amount may change, depending on the decisions the player makes during the game. (All the values and costs in this game are made up by ourselves)  |  Afbeelding met object, klok, oranje, bord  Automatisch gegenereerde beschrijving |
| Happiness The happiness level indicates how satisfied the residents of the city are. The happiness level starts at 75%. This level changes, depending on the choices the player makes regarding the sustainability of the city. A high happiness level means that people like living in your city, but at the same time it may also mean that here is a high CO2 level, which is bad. However, if the happiness level gets too low, people no longer want to live in the city. (We chose the word ‘happiness’ because it seems like the appropriate term)  |  Afbeelding met teken, klok, tekening  Automatisch gegenereerde beschrijving |
| CO2 levelThis level indicates how much CO2 there is present in the air of the city. When the level is at a 100% the game ends and the players has lost. This level starts at 80% and increases with 1% every month (hence five minutes in the game). The CO2 may change, depending on the decisions the players make during the game. The percentages are not based on real life occurrences.   | Afbeelding met klok, teken  Automatisch gegenereerde beschrijving  |
| Future vision With this button you can see the consequences of a certain choice in the future. This can be useful to limit a large amount of damage. |  Afbeelding met klok, object  Automatisch gegenereerde beschrijving |