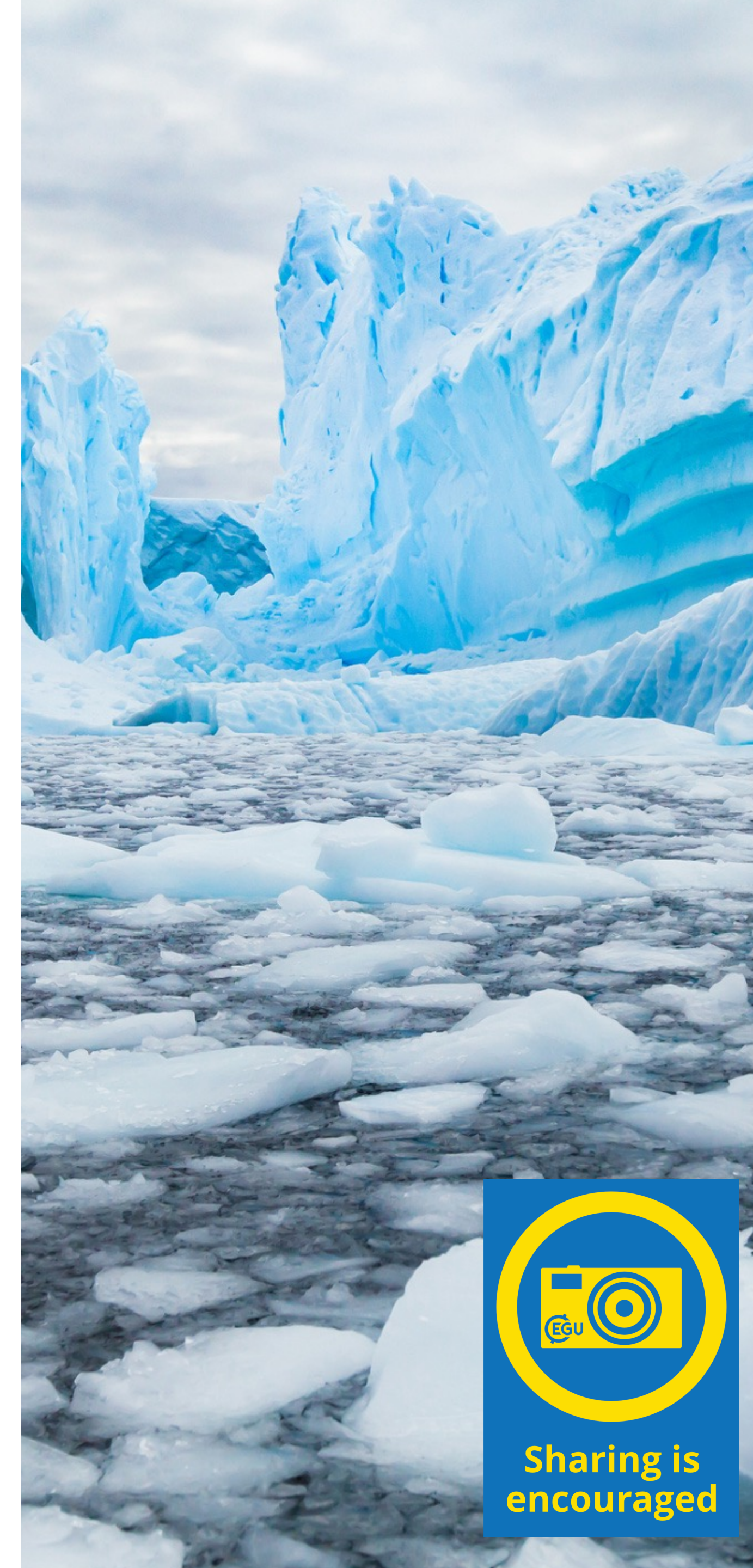


"Submersion": A board game for coastal risk exploration and adaptation planning



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Introduction and game overview

This game is developed as educational material in H2020-PROTECT



PROTECT is a European research project working on the projections of sea level rise in the future due to the melting of land ice

Sea levels are rising due to increased temperature and the melt of the cryosphere, affecting millions in the coming decades



Submersion is a strategic collaborative board game

The objective:
limit the risk of
submersion
and adapt the
beautiful coastal
town of Sea-city



Gameplay mechanics

Decade after decade, what adaptation plan will you develop?

Sea level is rising, and the City Council must take preventive initiatives so that your city is safe from submersion

Collaborate to implement your adaptation plan with limited resources.

You lose if:

- too many inhabitants leave the city
- the city has no funds anymore
- the city's popularity drops to zero
- the town hall or factory is permanently submerged

DECADE	SSP1-2.6	SSP5-8.5	SSP5-8.5
	LOW EMISSIONS sea level (in meters)	HIGH ÉMISSIONS sea level (in meters)	HIGH EMISSIONS + ANTARCTIC DESTABILIZATION sea level (in meters)
2020 2030	+0	+0	+0
2030 2040	+0,05	+0,05	+0,10
2040 2050	+0,10	+0,10	+0,25
2050 2060	+0,15	+0,15	+0,45
2060 2070	+0,20	+0,25	+0,70
2070 2080	+0,25	+0,35	+1
2080 2090	+0,30	+0,45	+1,35
2090 2100	+0,35	+0,60	+1,75
2100	+0,40	+0,75	+2,25

The turn sequence

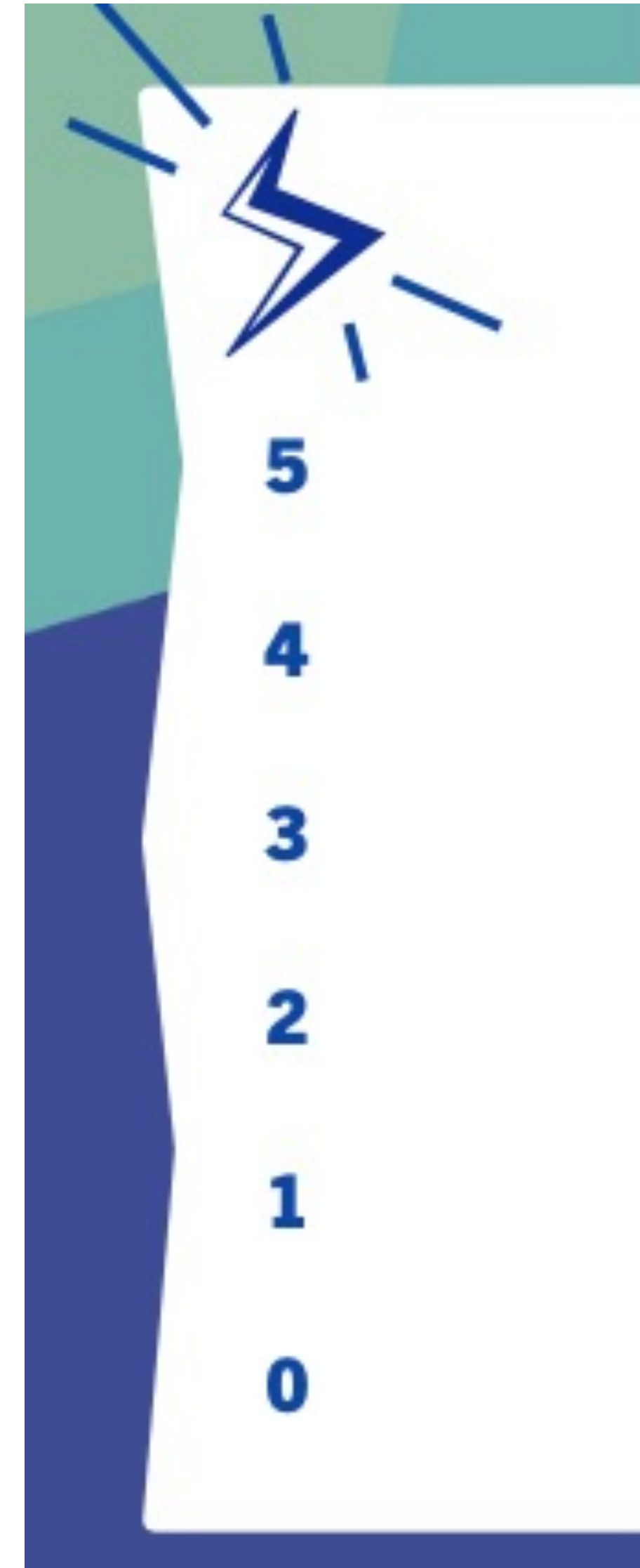
There are a total of 5 Action Points (AP) for the decade.

1 AP can be used to :

- apply a Development or Adaptation Measure card
- trigger the Scientist's research ability
- wait.

For each AP spent, an Event card is drawn, and its effects are applied immediately.

At the end of the turn, players check finances and popularity and check that all neighbourhoods are above the "new" average sea level.



Five event cards punctuate the decade



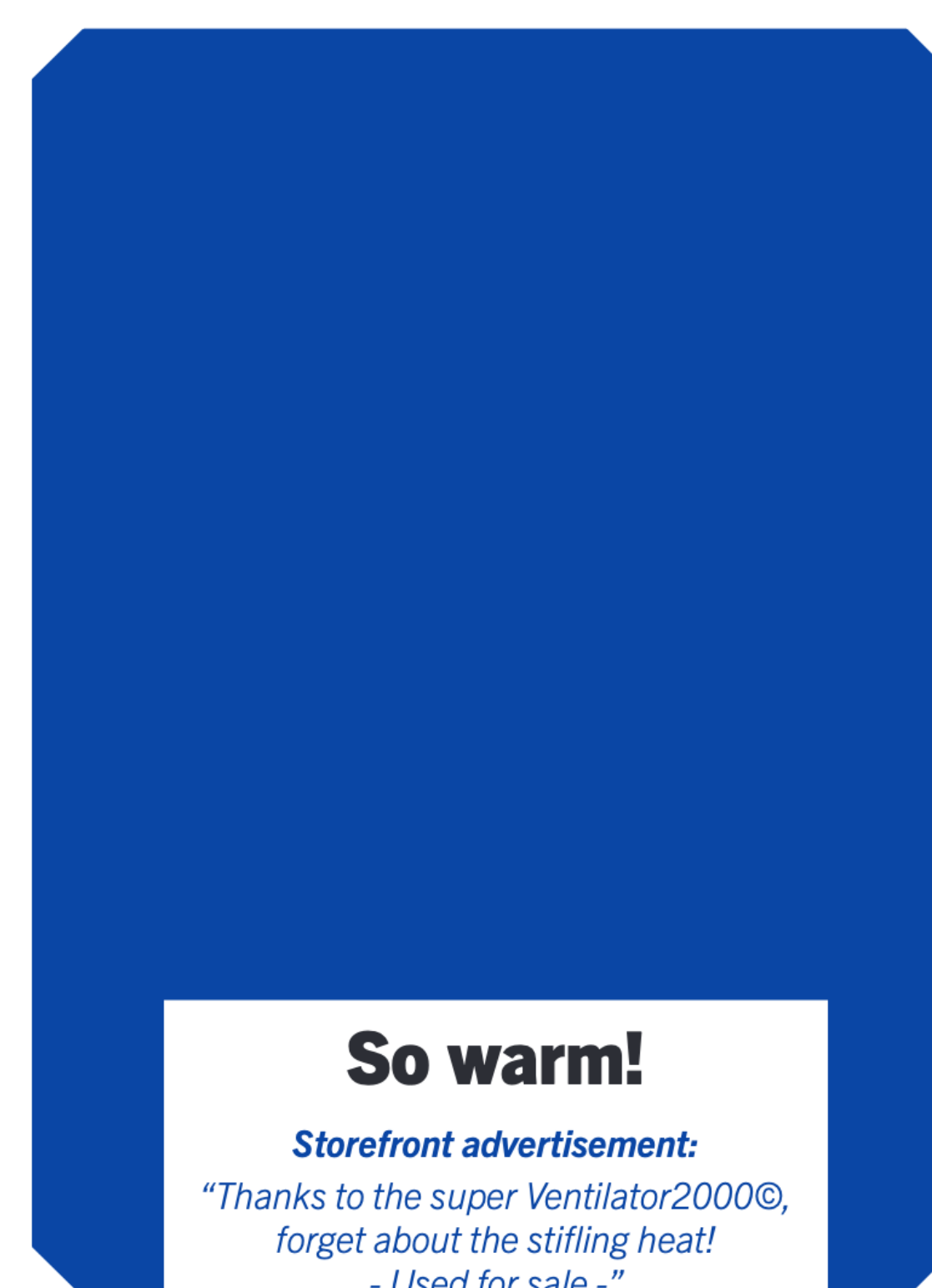



Industrial Accident
Your paper factory has exploded.
A resident from the industrial district must be relocated.

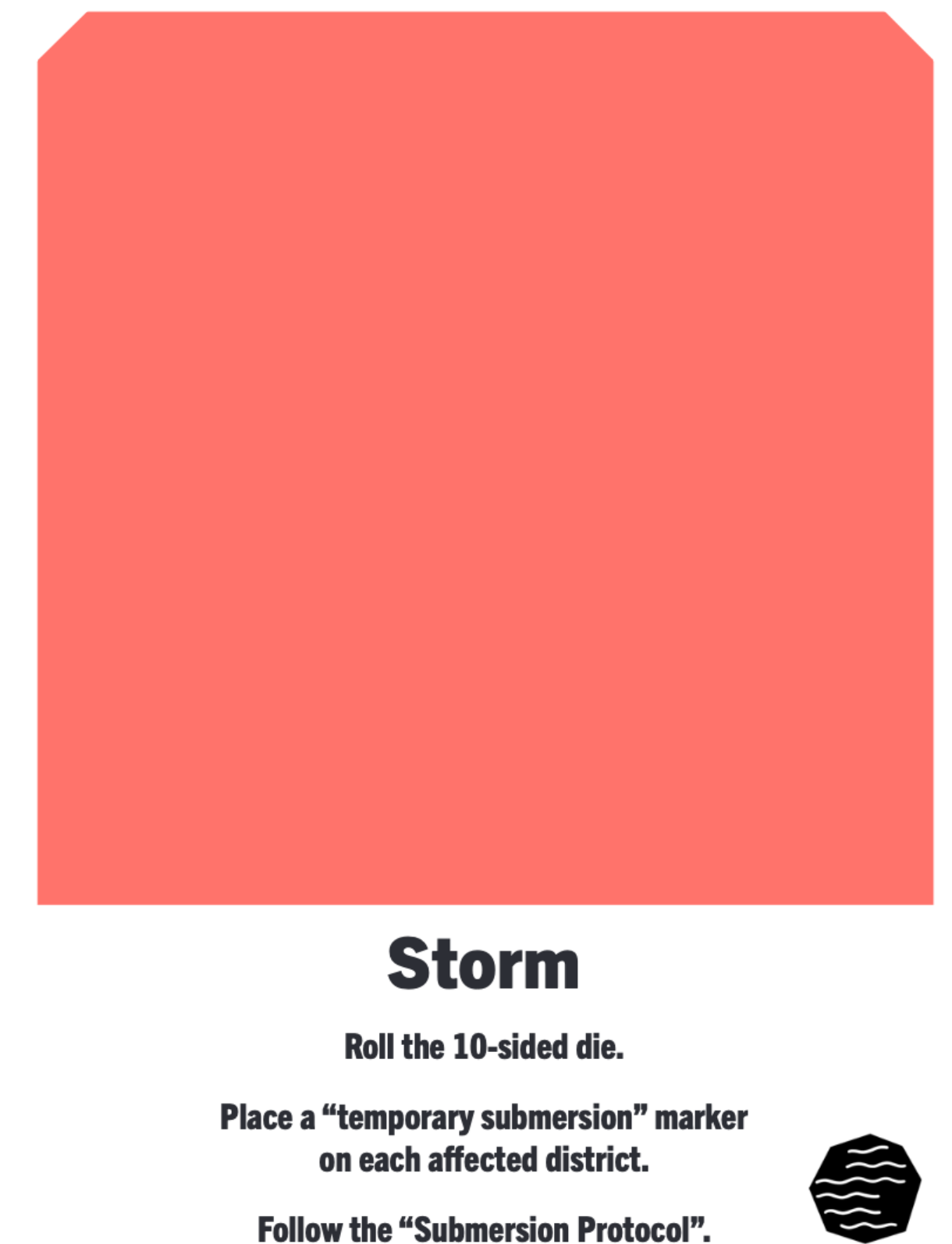





“Eco-city” award!
Seacity is celebrated for its ecological development and improved quality of life! Real estate searches in the region are booming!
The award is not granted if 5 residents or more have permanently left the city.



So warm!
Storefront advertisement:
“Thanks to the super Ventilator2000©, forget about the stifling heat! - Used for sale -”

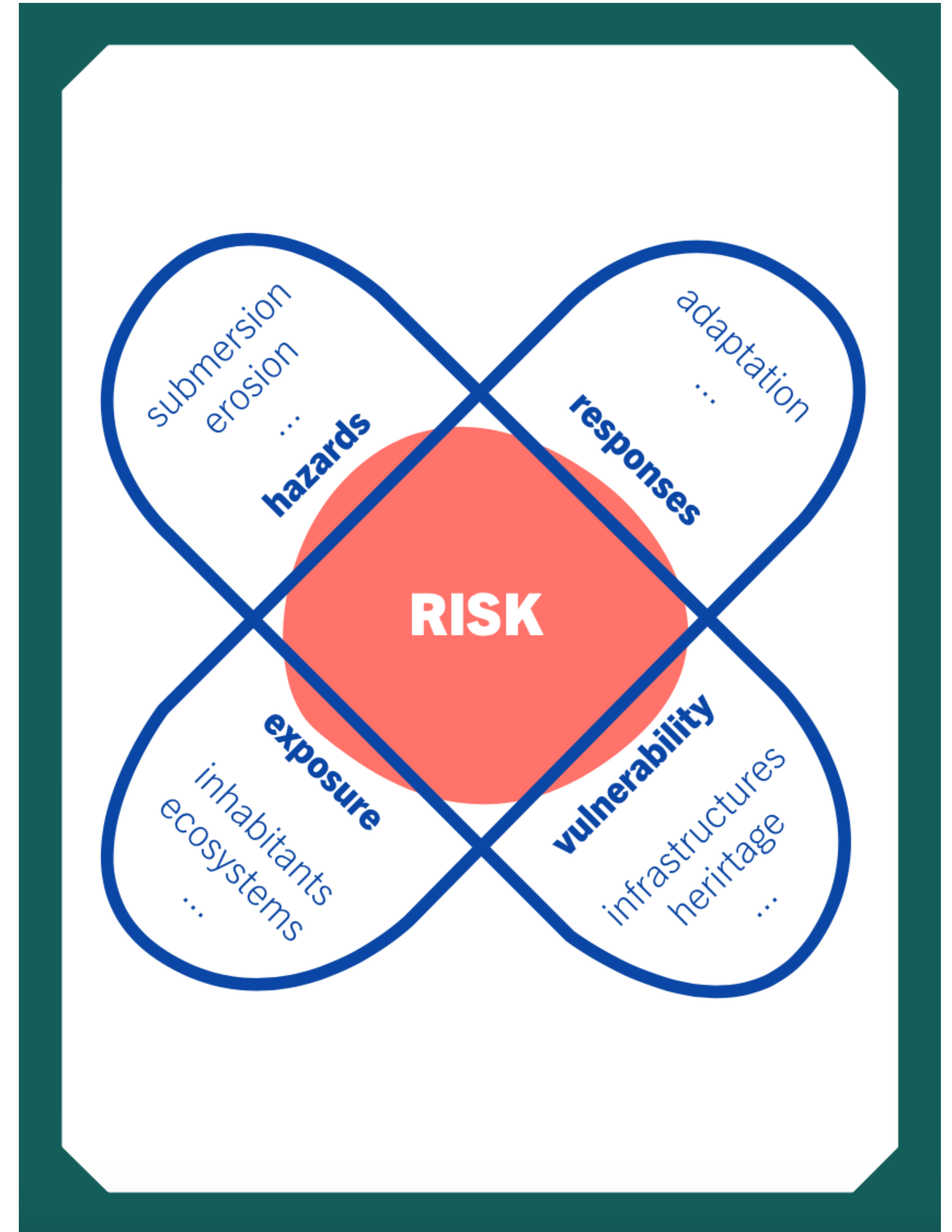


Storm
Roll the 10-sided die.
Place a “temporary submersion” marker on each affected district.
Follow the “Submersion Protocol”.




5 key educational objectives

1. Understanding Risk: Explore the concept of risk and its reduction strategies



2. Adaptation Responses: Learn about diverse responses to the risk of marine submersion



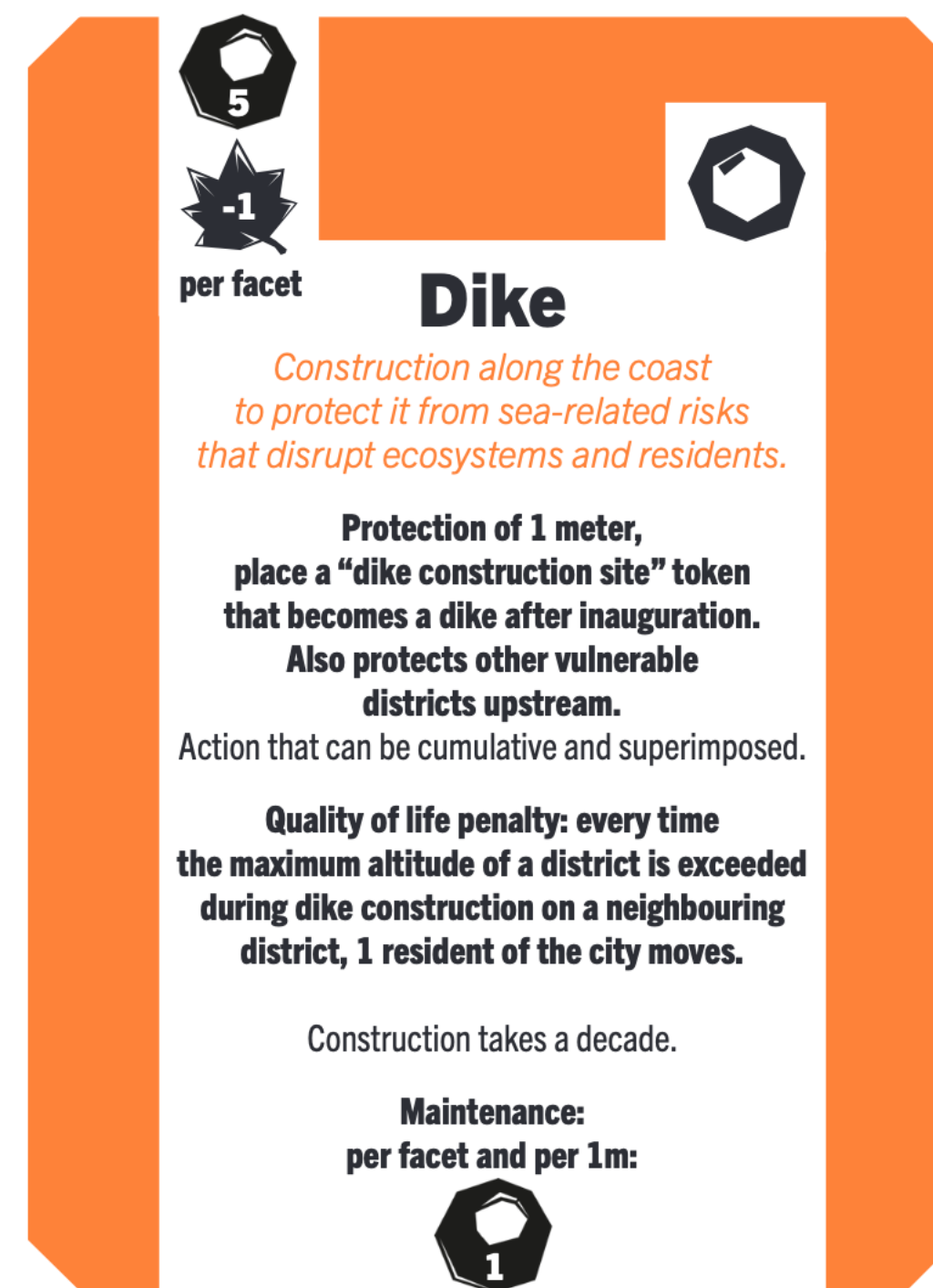
1
+1

Ecosystem restoration

Restoring natural areas (dunes, mangroves, lagoons, etc.) is an alternative to building dikes to reduce the impact of waves in coastal areas.

Provides 1m of protection against temporary submersion only.
Place a **“dune”** marker on the district and **relocate** one of its residents.
If there is no more room, the resident moves out.
When you accept the **“Green Spaces Decree”**, ecosystem maintenance costs 0.
Restoration takes a decade.

Maintenance per district:
1



5
-1
per facet

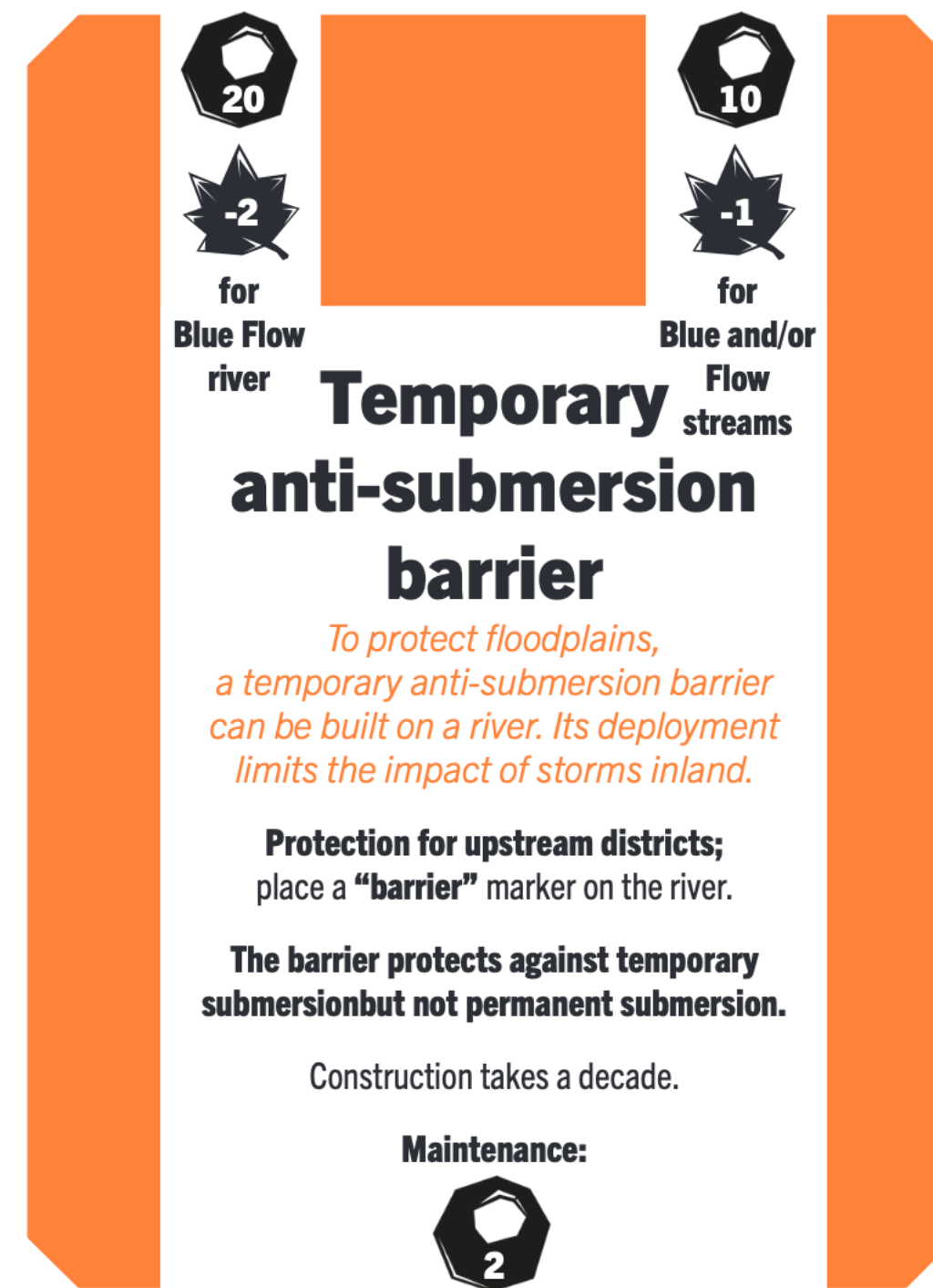
Dike

Construction along the coast to protect it from sea-related risks that disrupt ecosystems and residents.

Protection of 1 meter, place a “dike construction site” token that becomes a dike after inauguration. Also protects other vulnerable districts upstream.
Action that can be cumulative and superimposed.

Quality of life penalty: every time the maximum altitude of a district is exceeded during dike construction on a neighbouring district, 1 resident of the city moves.
Construction takes a decade.

Maintenance: per facet and per 1m:
1



20
-2
for Blue Flow river

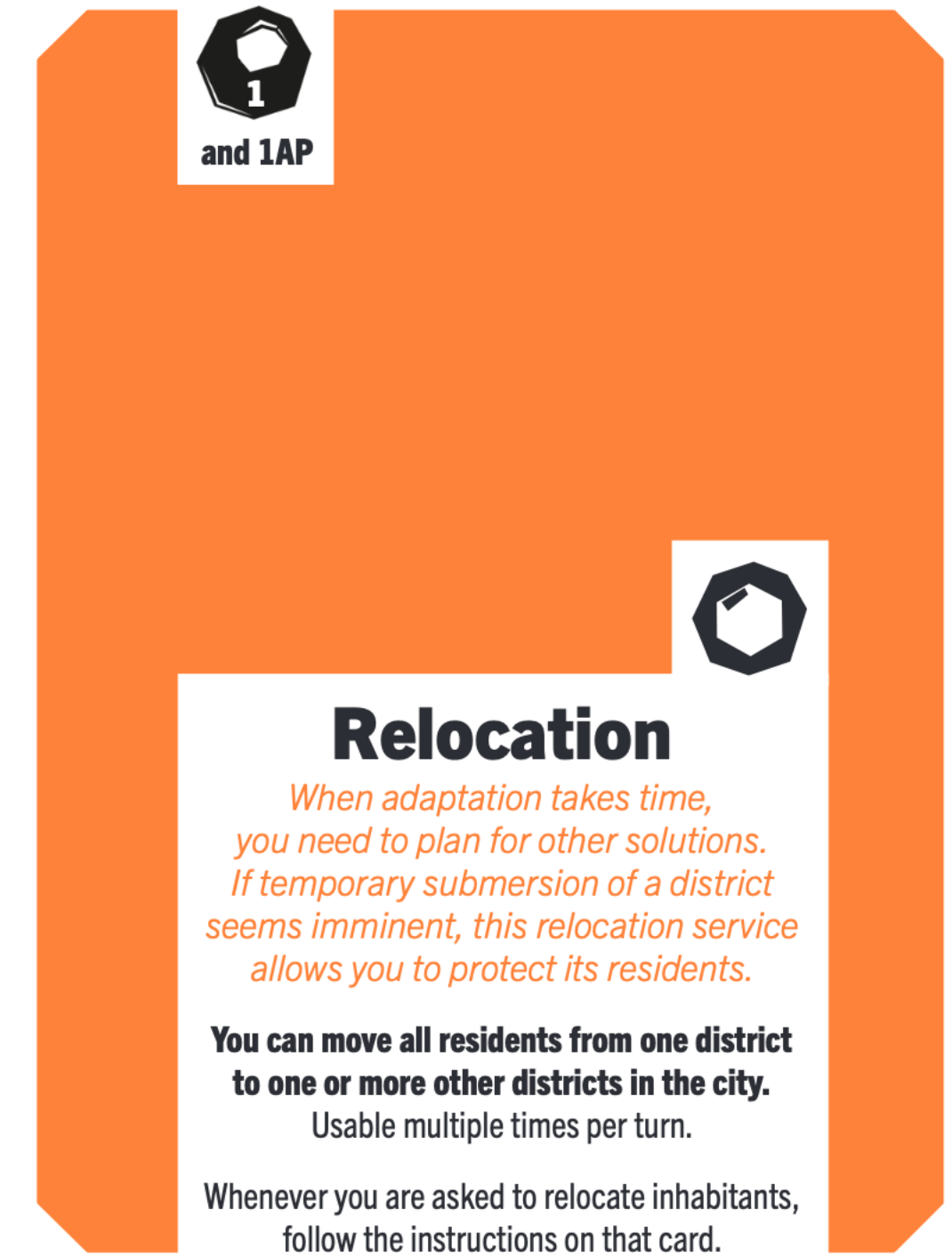
10
-1
for Blue and/or Flow streams

Temporary anti-submersion barrier

To protect floodplains, a temporary anti-submersion barrier can be built on a river. Its deployment limits the impact of storms inland.

Protection for upstream districts; place a “barrier” marker on the river.
The barrier protects against temporary submersion but not permanent submersion.
Construction takes a decade.

Maintenance:
2



1
and 1AP

Relocation

When adaptation takes time, you need to plan for other solutions. If temporary submersion of a district seems imminent, this relocation service allows you to protect its residents.

You can move all residents from one district to one or more other districts in the city.
Usable multiple times per turn.
Whenever you are asked to relocate inhabitants, follow the instructions on that card.

3. Climate Scenarios: Grasp the impact of different climate scenarios on sea level rise and adaptation difficulty

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4. Limits of Adaptation: Understand the constraints and limitations associated with adaptation measures



Relocation

Inhabitants permanently leaving the city.

-1★ for each inhabitant permanently leaving the city.

Place here the residents who are relocating. When all spaces are occupied, the game is lost.

The illustration shows a white bus with 14 seats. The first 12 seats are occupied by black icons of people in suits. The last two seats are empty. An arrow points to the empty seats with the text: "Place here the residents who are relocating. When all spaces are occupied, the game is lost."

In the event of a tie in choices made by players, the Mayor character has the authority to decide.

5. Temporal Aspect: Recognize that adaptation requires time and advance planning

Building and implementation of adaptation measures take at least a decade



The background features a series of overlapping, irregular geometric shapes in shades of teal, light green, and dark blue. The shapes are layered, creating a sense of depth and movement. The text 'Further steps' is centered in a white, sans-serif font.

Further steps

Further steps

We are editing the game for facilitated sharing (French and English version)

A training campaign is taking place at IGE for French teachers, together with a communication campaign, stay tuned!

We also have two other games resulting from the H2020 projet PROTECT, check them out:



Save the glaciers!

Escape Game (print-at-home and online) about glaciers

Expedition sea level
numerical interactive game for middle school students about links between sea level rise, ice melt, and human activities.



Further steps

THANK YOU FOR YOUR ATTENTION !

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