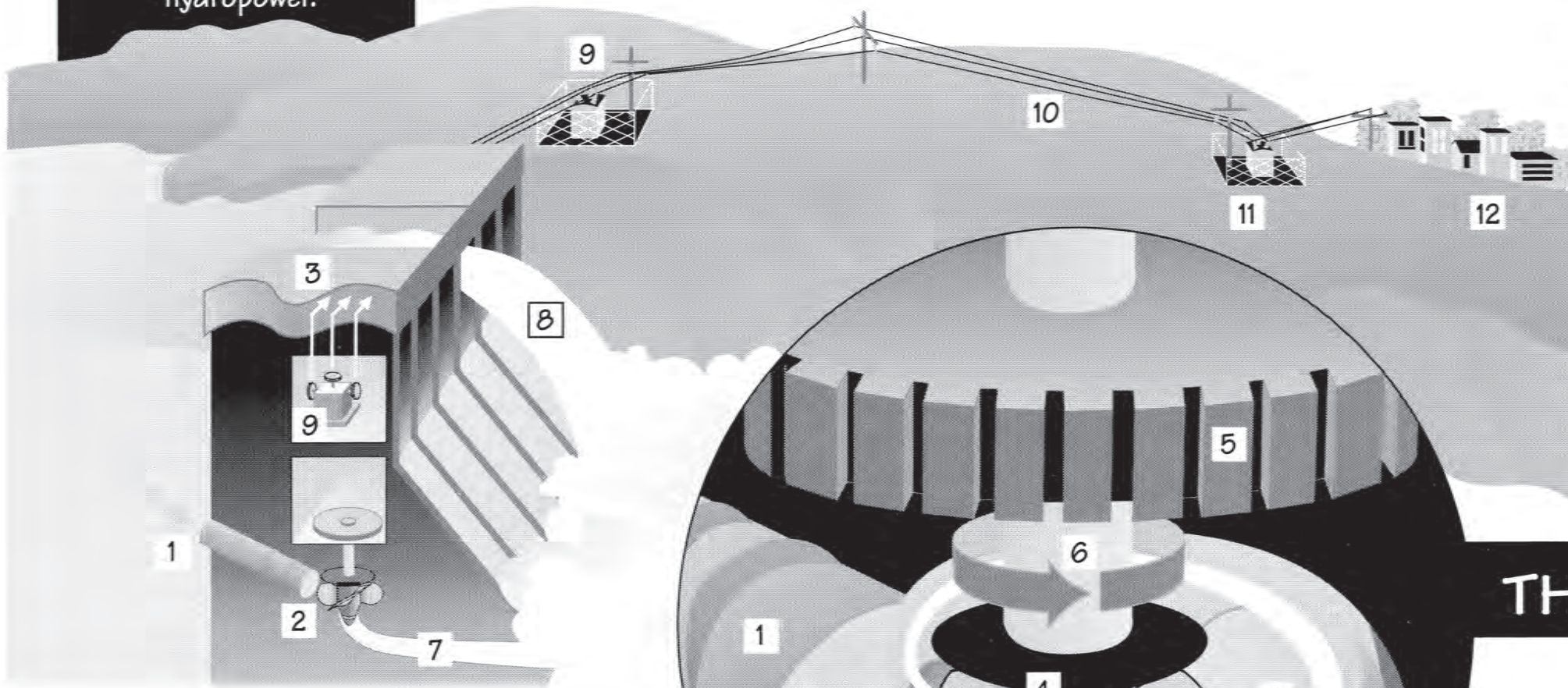


# HYDROPOWER

IT'S A NATURAL  
Approximately 60-80% of the Northwest's electric energy is supplied by hydropower.

# HYDROPOWER —

## What is it?



The creation of hydroelectricity begins at the dam, where the power plant converts the force of water into electricity. Water from a lake or river flows into a large pipe called a **penstock 1** located in the upstream side of the dam structure. The water then flows into the **turbines 2** inside the **powerhouse 3**. The turbine shaft is turned by the force of water pushing against the **turbine blades 4**. **Generators 5** connected to the **turbine's shaft 6** rotate as the turbines move, producing electricity. The same amount of water that entered the hydro project returns to the river **7** unchanged. Water not used for energy production is released over the **spillway 8**. **Transformers 9** convert the electricity generated to higher voltage levels for transmission over **powerlines 10**. Transmission lines carry the electricity to the **substations 11** and on to the **distribution system 12** where the voltage is reduced to levels for your use.

### THE HYDROLOGIC CYCLE NATURALLY RENEWABLE ENERGY

- Snowfall creates snowpack in the mountains.
- Rain and runoff from the snowpack fills rivers and streams.
- Electricity is generated at hydroelectric projects by using the force of water.
- Water passes through the turbines and returns to the river unpolluted and unchanged.
- The sun draws moisture from the ocean, forming clouds.
- The cycle begins again . . .



### THE BENEFITS OF HYDRO:

- Hydropower takes an unpredictable resource — rainfall and snowpack — and turns it into a reliable energy source.
- Hydropower is a clean and renewable energy source.
- Hydropower is the major source of the Northwest's low-cost electric energy supply.
- Hydropower projects provide recreation, irrigation, flood control, transportation and fish and wildlife habitat.



For more information contact the Bonneville Power Administration Public Information Center at 1-800-622-4520.



**Benefits of Hydro**

Clean and Non-polluting

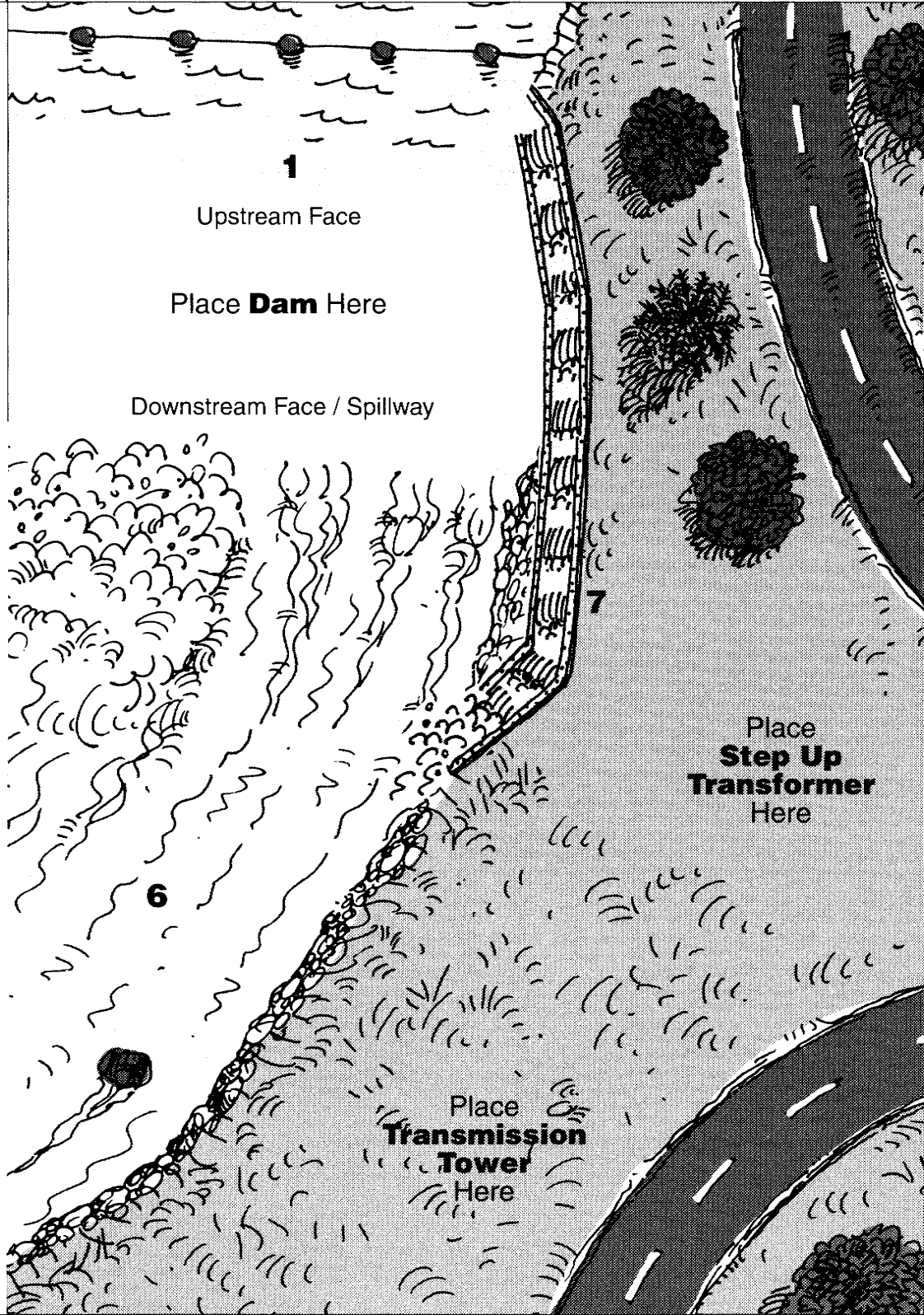
Recreation

Reliable

Habitus

Renewable

Low Cost



Upstream Face

Place **Dam** Here

Downstream Face / Spillway

Place **Step Up Transformer** Here

Place **Transmission Tower** Here

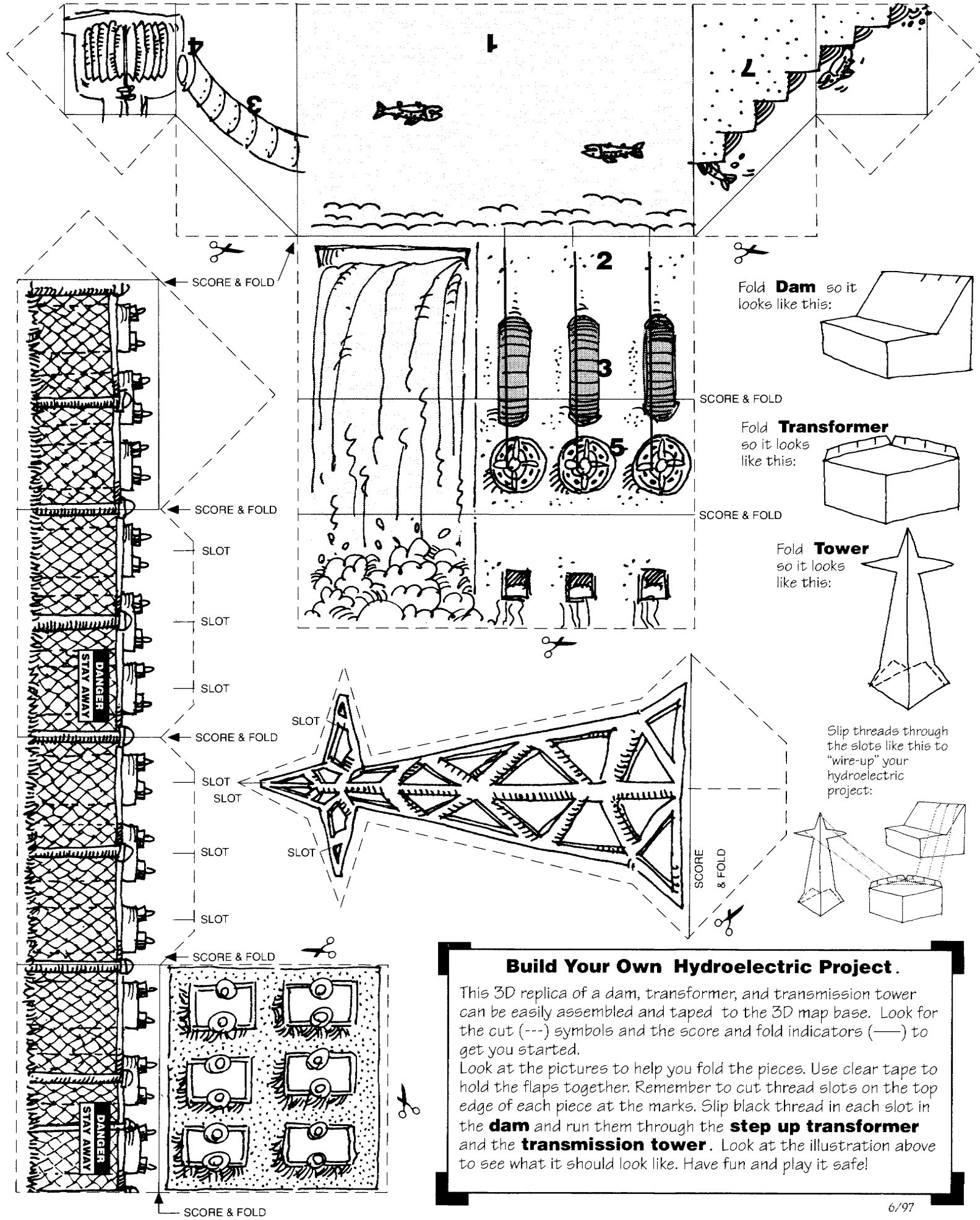
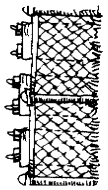
**Transmission Towers**

Transmission towers carry the transmission lines that carry the electricity to your city.

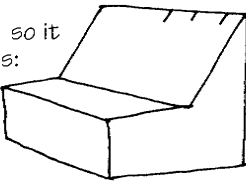


**Step Up Transformer**

A Step Up Transformer increases the voltage of the electricity so it can make the journey from the dam to your city. Substations reduce the voltage to make it usable

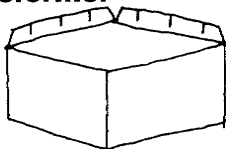


Fold **Dam** so it looks like this:



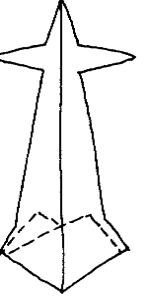
SCORE & FOLD

Fold **Transformer** so it looks like this:

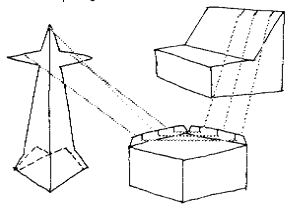


SCORE & FOLD

Fold **Tower** so it looks like this:



Slip threads through the slots like this to "wire-up" your hydroelectric project:



**Build Your Own Hydroelectric Project.**

This 3D replica of a dam, transformer, and transmission tower can be easily assembled and taped to the 3D map base. Look for the cut (---) symbols and the score and fold indicators (—) to get you started.

Look at the pictures to help you fold the pieces. Use clear tape to hold the flaps together. Remember to cut thread slots on the top edge of each piece at the marks. Slip black thread in each slot in the **dam** and run them through the **step up transformer** and the **transmission tower**. Look at the illustration above to see what it should look like. Have fun and play it safe!