

2. Hisui's New Power Plant

The Galaxy Team has decided that in order to advance the research on Pokemon and the Pokedex, Jubilife village needs a brand new power plant. Luckily, Professor Laventon has discovered that the Pokemon, Voltorb, is the best candidate to help power the village.

Voltorbs can cleanly and efficiently produce electricity. An average Voltorb is about 0.5m (1'08") tall and weighs 10.4 kg (22.8lbs). However, they are uncommon and are only found in the Sacred Plaza.

Objective: How many Voltorbs will you need to catch to fully power the village. Describe each step in your thought process.

(Considerations will be made of Pokemon Platinum Statistics)

Step 1. Consider Scaling

- The **Sinnoh** Region is based off of the real life [Hokkaido](#) Region in Japan
- **Hokkaido's Population** is around [5.383 million](#) as of 2015
- **Sinnoh's** population is **755** People in Pokemon Platinum
- $5,383,000 / 755$ is about **7,130**
- **Assuming this scales for every aspect of Hokkaido to Sinnoh this is the scaling factor we will use**

Step 2. Consider Jubilife city power requirements

- **Global Trade Station - Assumed 10% increase in city population**
 - **Jubilife Population** = $124 + 12.4 = 136.4 \times 7130$ (Hokkaido Scaling)
 - This is equivalent to a city population of **972,532 people**
 - The city of Austin, TX with a population of around **931,830** uses on average [1000kWh](#) per month
 - I like to give the trainers in the pokemon universe the benefit of the doubt and assume they use slightly less energy than the average energy consumption per capita of a US city so...
- Jubilife City's Monthly energy consumption is around **975 kWh / month**

Step 3. Voltorb Electricity Output

- Utilizes attack move spark which has a 30% chance to paralyze a target
 - It takes between **10 and 30 mA** to paralyze muscle without causing respiratory paralysis
- Let's assume Voltorb using spark at full attack power outputs **30 mA of electricity** but when not in a battle state (resting) Voltorb usually outputs around **20mA when using spark**

- Voltorb will output electricity for **12 hours** before he has to rest and recharge. That's 360 Hrs/Month
- An electric eel, one of the few animals who can naturally output electricity, can produce around **500 Volts** so lets say Voltorb can produce **600 Volts** due to his larger size in relativity to an eel
- **$(0.02A \times 360hrs)$ at 600 Volts = 4.32 kWh/month**
- **$975/4.32 = 225.694$ Voltorbs**
- **Therefore It would take around 225 Voltorbs to power Jubilife City**