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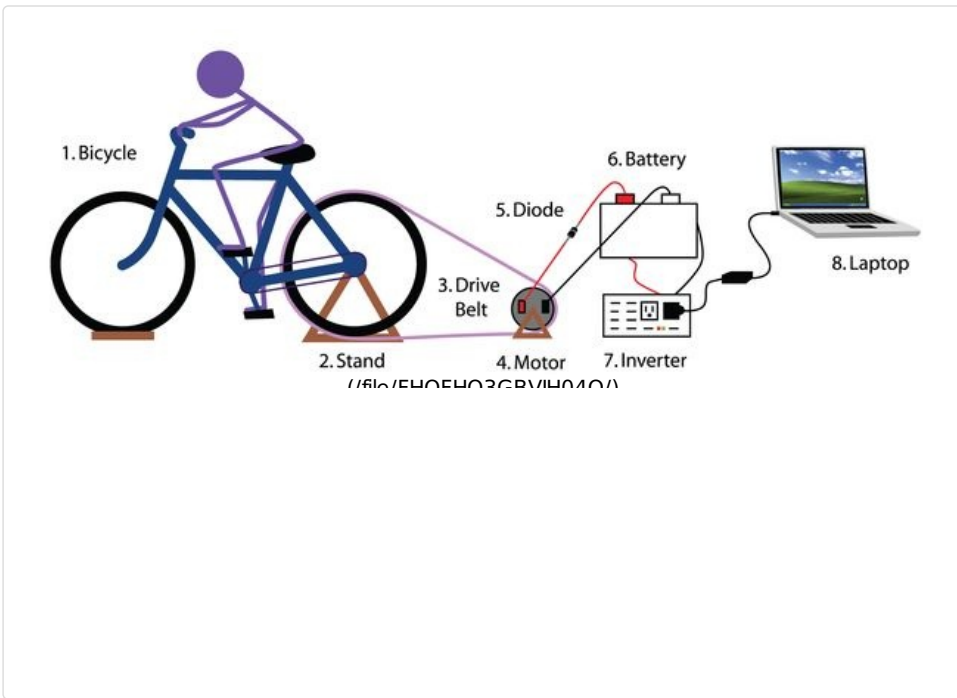


How to Build a Bicycle Generator

by saullopez52 (/member/saullopez52/) in green (/tag/type-id/category-home/channel-green/)

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The intention of this project is to build a straight forward human powered generator from a used bicycle and to use it to power light bulbs, blenders, cell phones, laptops, and other small appliances. This project will help one develop engineering skills while learning about a clean way of generating electricity.

The project was created as part of Infrastructure Academy's environmental technology curriculum for high school students, so it is intended to be both achievable and affordable.

Before continuing with the actual bicycle generator, one should understand how it works, and the components that make it up. View the PowerPoint presentation before moving on to the next step.

PartsTools

- 2" X 4" Wood
- Wrench

Related

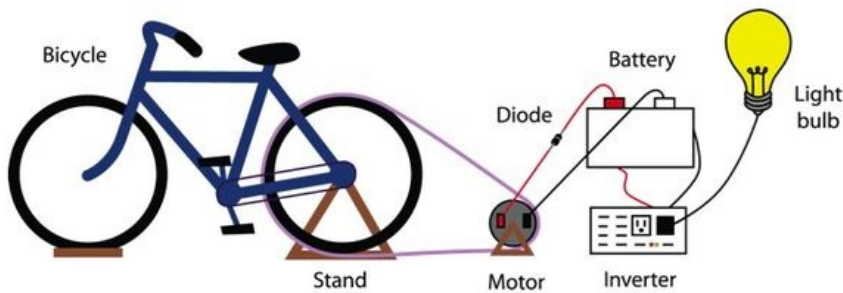
- homage to duchamp's bicycle wheel - a dual mode led lamp (DC hub generator or AC plug...)**
- Hand Power Electricity Generation (/id/Hand-Power-Electricity-Generation/)**

- V-belt
- Saw
- Diode
- Wood screws or nails
- Battery
- Hammer or Screwdriver
- Inverter
- Tape Measure
- Wire
- Screwdriver
- Motor (12-V or higher)
- Perforated plumbers steel
(if motor does not have mounting bracket)

Note: The bicycle generator could be accomplished by skipping steps 5, 6, 7, and 8, to save money, but connecting anything other than a halogen lamp directly to the motor is not recommended due to the varying voltages.

Step 1: PowerPoint Presentation

How Does a Bicycle Generator Work?



Energy Generation and Distribution

Infrastructure Academy

Show All Items



'No-welding' pedal generator stand (/id/No-welding-pedal-generator-stand/)



Strategy for Joining Two Bicycles (/id/Strategy-for-Joining-Two-Bicycles/) by Phil B (/member/Phil+B/)



Ultimate 10 Watt USB Bicycle Generator (/id/Ultimate-10-Watt-USB-Bicycle-Generator/)

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Step 2: Obtain a Bicycle and Remove the Back Tire.



You will need to unscrew the back rim to remove the tire and tube. Since the only part of the bicycle that needs to work is the chain and pedals, a junk bike or an old used bike would work just fine.

Step 3: Build a Stand to Elevate the Bicycle Off the Ground.



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The design of the stand is completely up to you. A few examples are shown below. Just be sure that the stand keeps the bike elevated and secure. If your bike has pegs attached to it, make sure your stand accommodates that feature.

The stand should be built so that the rear wheel of the bike is about 5-7 inches off the ground. The dimensions of your stand will be specific to your bike.

Before beginning construction of the stand, be sure to draft a design with appropriate dimensions. A design on paper will save time and prevent mistakes.

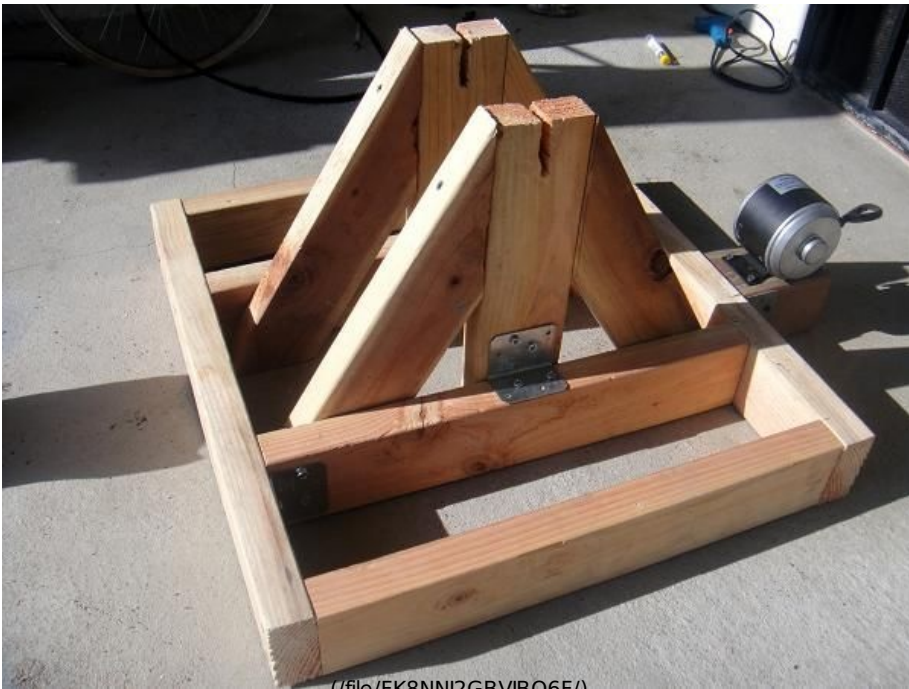
Step 4: Attach the Drive Belt Along the Back Rim.



//616/56M204RCPV/BCV4/

A drive belt can be purchased at any auto parts store. You will need to remove the back rim to attach it. Make sure to measure the distance from the motor to the rim so you obtain the appropriate size.

Step 5: Attach the Motor to the Stand.



A 12-volt DC motor or higher is recommended. The wattage of the motor depends on what you want to power. The motor should be securely mounted to the stand. Mount the motor at a distance that will tightly secure the drive belt on the motor shaft. The belt and motor shaft should spin concurrently - make sure there is no slipping between them.

Step 6: Place a Diode in Series With the Motor and Battery.



Make sure the diode is only allowing current to flow from the motor to the battery. The cathode should be pointing towards the positive terminal of the battery.

Step 7: Connect Battery to the Diode.



The battery should be connected in series with the motor and diode. The negative lead from the motor should attach to the negative terminal of the battery. The positive lead from the motor should be attached to the diode, and the diode to the positive terminal of the battery.

Step 8: Connect the Battery Leads to the Inverter.



You could use an adapter to connect the battery to the inverter, or you will need to solder or tape the battery's leads to the inverter so the circuit is secure. Be sure to correctly connect the positive and negative terminals of the battery to the inverter or you will blow the fuse in the inverter.

Step 9: Plug the Appliance of Your Choice Into the Inverter.



(/6k/EYHXYZGRVITXWEA)

(/6k/EQ15H75GBMCTHWA)

Once the motor is secured to the belt, you will need to use a multimeter to measure how much voltage is being exerted while you pedal. Depending on how much you exert, you will be able to power small appliances. With the knowledge you've gained, try to make changes that will make your generator better and more efficient.

Fun Ideas

Here are just a few suggestions to what you can do using your new bicycle generator.

Charge your phone and exercise: Ever charged your phone and just waited until it was done charging? Why not get a workout and charge it

at the same time! See how much time it takes to charge your phone. Try to set a time and try to beat it in the future.


Human-Powered Smoothie: Think you can make a smoothie without wasting energy in your home? See if you can generate enough energy in your bicycle generator to run a blender. Then, see if the blender has enough power to make a smoothie.

Eco-Breakfast: If you are the type of person who wakes up in the morning wanting to exercise, then try this. Use the bicycle generator to make some waffles and toast. There's nothing like building up an appetite, exercising, and cooking at the same time.


Think about some more fun ideas you can execute using the generator and test them out!


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EduardD8 (/member/EduardD8) 13 days ago Reply


Hi! Can you help me with the belt? Which belt did you use? It is not visible from the photo. I have a problem to choose a belt on the chain sprocket :/ I have the same motor and the same sprocket as you do. Thanks a lot!

Please write me also to edindoffer@yahoo.com



YashB59 (/member/YashB59) 2 months ago Reply

sir how much power will it make.(ampere,volts,watt)



dumpstar (/member/dumpstar) 2 months ago Reply

I attached a PM DC treadmill motor directly to this 250w Grid Tie Power Inverter:

<http://a.co/cLWYIiw> (<http://a.co/cLWYIiw>)

And it plugs directly into my wall and brings down my electric bill.



MikaM2 (/member/MikaM2)

3 months ago

Reply

IMHO. From inverter there will be big losses of energy. It is better to use 12V battery and to connect the laptop via car devices.



VasV (/member/VasV)

11 months ago

Reply

I was actually hoping this would have been, or included instructions, on how to make the bike produce power while you're outside doing stuff, not just a stand still bike. I want to be mobile while I power a battery on the bike. My goal was to replace the back tire with a motored tire, and charge the battery that powers this motor while I ride, and turn the motor on when I need to go up a big hill or need a break in peddling for a bit.



Theelvenarcher (/member/Theelvenarcher) ▶ VasV (/member/VasV)

3 months ago

Reply

so you clicked on this even though you wanted something completely different.



adriansebastiani (/member/adriansebastiani) ▶ VasV (/member/VasV)

10 months ago

Reply

https://www.alibaba.com/product-detail/MOTORLIFE-OEM-Electric-Bicycle-Kit-Regenerative_60303390476.html?spm=a2700.7724857.0.0.FK48xI&s=p



smart maran (/member/smart maran)

4 months ago

Reply

why we using diode in the battery??



spadoosh (/member/spadoosh) ▶ smart maran (/member/smart maran)

4 months ago

Reply

A diode allows the current to flow in one direction. It stops the battery providing power to the motor.



martinbeaulne (/member/martinbeaulne)

8 months ago

Reply

Please, before trying to build this, be sure your motor uses permanent magnets; otherwise it will not generate electricity.

Few motors, these days, use magnets. I'm very surprised no one talked about that.



Mr_knownothing (/member/Mr_knownothing)

a year ago

Reply

Can I use a stepper motor for this project?

THANK YOU



JamieF32 (/member/JamieF32) ▶ Mr_knownothing

(/member/Mr_knownothing)

8 months ago

Reply

Probably not, as a stepper motor has wierd wiring (not -ve and +ve)



forgivableirwin (/member/forgivableirwin)

8 months ago

Reply

How much would the materials cost? Thank You!



AbdullahK45 (/member/AbdullahK45) made it!

10 months ago

Reply

Hello

I have gotten all the parts ready to build this the only problem is that I cant get the motor to spin as the connection is too lose. How did you manage to get it to rotate like that? This is the v belt and motor I used. Many thanks.



(<https://cdn.instructables.com/FMR/C047/IQE1ZYFP/FMRC047IQE1ZYFP.LARGE.jpg>)



GroceryO (/member/GroceryO)

a year ago

Reply

What will the Independent, dependent and controlled/fixed variable be for this experiment?



YasserK3 (/member/YasserK3)

a year ago

Reply

I could not find the right motor or generator to use .. Can someone plz attach me a pic of the right one ,, and what kind of belt I should use Thx



Dick_Knipple (/member/Dick_Knipple) ▶ [YasserK3 \(/member/YasserK3\)](#)

a year ago

Reply

Try a car alternator



chidvilash (/member/chidvilash)

a year ago

Reply

am doing on this project...

can i know ,how much distance to be kept between the cycle and dynamo in order to get max power? is this distance effect the power generation?

can we add any extra equipment ,in order to look project differ from simple



DearH (/member/DearH) ▶ [chidvilash \(/member/chidvilash\)](#)

Reply

a year ago

I dont think distance actually matter but you can add a couple of gears in shaft which connects your dynamo with belt or add a shaft, use gear ratio gear 1 teeth/gear 2 teeth make sure first gear has more teeth than second one for more speed and efficiency.



JohnnyW16 (/member/JohnnyW16)

a year ago

Reply

What is the point of the car battery? And What are those blue and red wires called?



Tirtharajking (/member/Tirtharajking)

a year ago

Reply

Can i use fan's motor to generate elcricity???



KyleM80 (/member/KyleM80) ▶ Tirtharajking (/member/Tirtharajking)

a year ago

Reply

Granted, while there are other factors that play into it (such as how MUCH electricity you can generate), yes you should be able to.



notoriouslev (/member/notoriouslev) made it!

a year ago

Reply

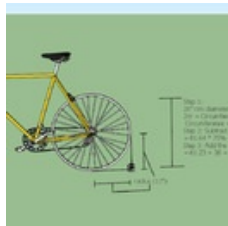
So I came up with a way to guesstimate the v-belt length you'll need to order for this project. It's pretty simple and should work with any sized bike. A quick note. You may want a bit more room for your generator, but mine is small enough that it fits nicely at the outer edges of the rim (see pic)

Step 1: Measure the size of your bike's rear wheel. Mine (from rim to rim - not including the tire was 26" tall, which means I have a radius of 13". The equation to get the circumference of the rim is $2 \times \text{pie} \times \text{radius} = 2 \times 3.14 \times 13 = 81.64$ " around.

Step 2: Subtract 1/4 of the circumference: $81.64 \times 75\% = 61.23$

Step 3: Add the diameter: $61.23 + 26 = 87.23$ " Long

Optional Step 4: You can add extra length to the v belt in case you don't want the generator sitting just below the rear wheel's exterior. For instance to place the generator 1 foot behind the rear wheel, you add 12" for the extra distance behind the wheel, and then you use the **Pythagorean theorem** to get the additional v belt required to reach back to the tire: $(12 \times 12) + (13 \times 13)$...then get the square root = 17.7". So to place the generator 1 ft behind the rear wheel of this bike, we add 29.7 inches to the 87.23" we already had and get 116.93"



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chidvilash (/member/chidvilash)

a year ago

Reply

am doing on this project..

can i know ,how much distance to be kept between the cycle and dynamo in order to get max power? is this distance effect the power generation?

can we add any extra equipment ,in order to look project differ from simple



YasserK3 (/member/YasserK3)

a year ago

Reply

Hello

I'm working on A Bicycle Generator project . I need some help with the calculation like the equations for calculating Ratio and speed ,,, plz if u can help me with the calculation here is my email.

Rushoud@gmail.com

Thanks



Mariaalejandraescalante (/member/Mariaalejandraescalante)

Reply

If I use a 12 v motor, 24 v battery. Which inverter do I need, and which diode?

THANK YOU



HarshitK4 (/member/HarshitK4)

a year ago

Reply

can any one give synopsis onthis



mohameda186 (/member/mohameda186)

2 years ago

Reply

what is the out put power of this setup ?



AlexM154 (/member/AlexM154) ▶ mohameda186

(/member/mohameda186)

a year ago

Reply

Power will be limited by your electrical generator, or your pedaling ability, whichever is smaller. Note, average long-time (e.g. an hour exercise) human pedaling ability is about 100-200W.



AdityaP32 (/member/AdityaP32) ▶ mohameda186

(/member/mohameda186)

2 years ago

Reply

Exactly the same Question I also need to know ??



krishnakk (/member/krishnakk) ▶ AdityaP32 (/member/AdityaP32)

a year ago

Reply

it depends how much current and voltage u are able to draw from motor.



akosikulot (/member/akosikulot)

a year ago

Reply

what about the diode, what kind of diode to use? any specific resistance or wattage?



krishnakk (/member/krishnakk) ▶ akosikulot (/member/akosikulot)

a year ago

Reply

u can use diode acc.to amp. producing. diode having least voltage drop . may be schottky diode



krishnakk (/member/krishnakk)

a year ago

Reply

can i use washing machine motor (220v, 50Hz, 1 phase, 4 poles)



ddemille (/member/ddemille)

3 years ago

Reply

Can you just use a altenator instead of a motor? Or are they the same thing...



CrashA (/member/_CrashA_) ▶ ddemille (/member/ddemille)

Reply

No they are not the same thing. An alternator is an AC

2 years ago

generator which requires electricity to excite the rotors magnetic field (since there are no magnets in an alternator). When the voltage gets to about 12v+ it will disconnect the battery since it would have "self excited" the rotor by the electricity it is generating itself. The problem is, is that the alternator needs to be spinning at an a solute minimum of about 800RPM+ to start self exciting. You need to spin the rotor at about 1000-3000RPM depending on the alternators specifications in order to generate the amount of power its rated at / you want to generate.



brightout27 (/member/brightout27) ▶ [_CrashA_ \(/member/_CrashA_\)](#)

Does that mean a sufficient energy is still generated if the dc motor will be run up to 100 RPM? Thanks!

2 years ago

Reply



souheib.sfaxi (/member/souheib.sfaxi)

2 years ago

Reply

Is this battery rechargeable ? How does it work exactly ?



GregH5 (/member/GregH5) made it!

2 years ago

Reply

What size diode do I need?

Greg.hoedt@gmail.com



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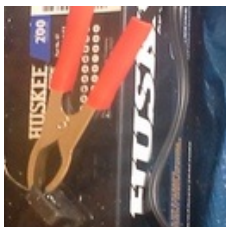


duckyforbes (/member/duckyforbes) made it!

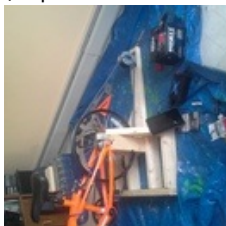
2 years ago

Reply

I made this for my middle school science project. I just twisted the diode around the wire from the motor and held it in place with the clamp of the inverter. Why was the live wire from the motor the black wire and not the red wire? The red wire did nothing, but when I connected the black wire, the motor turned (before I added the diode)



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ash.springer.9 (/member/ash.springer.9) ▶ [duckyforbes](#)

([/member/duckyforbes](#))

2 years ago

Reply

if i understood this right , you need both wires connected to complete a circuit, current flows from negative to positive and without the diode the battery will power the motor as it can leak backwards causing the motor to move in the opposite polarity to the direction you are driving it to create power.



jvanmatthew (/member/jvanmatthew) ▶ duckyforbes

(/member/duckyforbes)

2 years ago

Reply

Hello i am doing this same project. Did you do a display board for it? If so can you take a pic of it and send it to my email. My email is javanmsterling@outlook.com.



MuhammadA22 (/member/MuhammadA22)

2 years ago

Reply

i want to charge a 12 v 200amp battery with this method it is possible ? and i want to charge it in short time 20 to 25 mints ??? please reply some one



dmeyer13 (/member/dmeyer13)

3 years ago

Reply

what if i hook the motor straight up to the chain instead of using a v belt and back rim



CrashA (/member/_CrashA_) ▶ dmeyer13 (/member/dmeyer13)

Well the ratio would differ that's for sure.

2 years ago

Reply



kjdmac (/member/kjdmac)

2 years ago

Reply

Thats Awesome!

but why use a motor? mechanical power from the bike is converted into electrical power, not the other way around



CrashA (/member/_CrashA_) ▶ kjdmac (/member/kjdmac)

Because a DC motor can work as a generator as well as vice versa. At the end of the day, its just a rotating coil inside a magnetic field - which obviously generates an electrical current.

2 years ago

Reply



MuhammadA22 (/member/MuhammadA22)

2 years ago

Reply

admin where are you?



MuhammadA22 (/member/MuhammadA22)

2 years ago

Reply

admin where are you?



MuhammadA22 (/member/MuhammadA22)

2 years ago

Reply

i want to charge a 200amp Battery with 12 volt dc car alternator it gives 30 to 35 amp in normal speed , on extreme speed i think 45 amp? it is possible ? how many minutes required to charge a 200 amp battery?can i charge the Battery with cycle Generator and at the same time can i use the Battery power with an 1000 or 3000 watts inverter/ups

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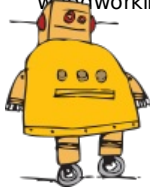


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