

NEW EFFICIENT AND COST SAVING WIND TURBINE INVENTION

1. Problem statement

Challenges to the large-scale implementation of wind energy include siting requirements such as wind availability, aesthetic and environmental concerns and land availability. Wind farms are most cost-effective in areas with consistent strong winds. A wind farm is a cluster of wind turbines (up to several hundred) erected in areas where there is a nearly steady prevalent wind; such areas generally occur near mountain passes. As seen in the diagrams below each erected wind turbine tower have the following components,

- Generator,
- Gear box
- Controller,
- Power cable,
- Yaw drive,
- Yaw motor,
- Brake,
- Blade, rotor and others

Each of these components has high cost and electric power will not be generated without each ones. So each wind turbine tower cost high to erect and keep in mind that after each towers produce the electric power it needs to be collected, regulated and transmitted in to one system or power station for use or transmission to end users. This also adds big expense to it. When there is electrical and mechanical failures in each towers, maintenance personals have to climb up risking their lives every time to fix the electrical problem and this also adds more cost to the running cost.



Figure 1 - Wind turbines in Tracy, Calif.

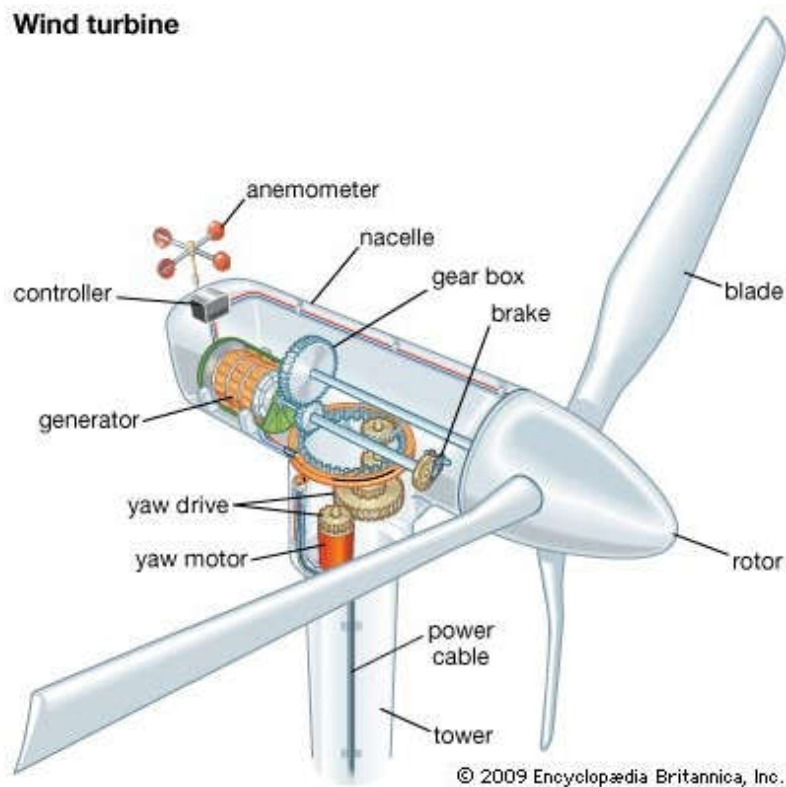


Figure 2 - Components of a wind turbine.

2. Our Solution

This project is about building a new design wind turbine that is very efficient in generating electric power with very low cost in comparison to the existing technology.

The main working principle of this new mechanism is instead of each wind turbine towers generate electric power individually, each wind turbine towers (6 wind turbine towers in this design) combine their mechanical energy that is converted from the wind via the turbine blades in to one mechanical rotating shaft energy that is collected with a mechanical system to be directed in to one generator to produce electric power. This will save cost big time because instead of using 6 generators, 6 gear boxes, 6 controllers, 6 power cables and etc, this system use 1 electric generator, 1 gear box, 1 controller, 1 power cable and 1 other components for every 6 wind turbine towers. It also saves electrical maintenance cost because all the electrical system will be on the ground that the maintenance personals or inspection team will not have to go up in to the tower. Combining the six mechanical in to one also produce same amount of energy because as they combine each towers, the torque will increase in multiplication of the number of the combined system. The other advantage of the mechanism is electric power collection is reduced in 1/5 because there will be one generator for every 6 tower.

The transmission of the mechanical system is done by using gear transmission system composed of mainly bevel gear and sun-and-planet gear. The bevel gear is used first on the initial mechanical rotating shaft that is generated by the wind turbines blades from the wind to transfer the horizontal rotation shaft to vertical 90 degree shaft which is found inside the erected tower. Then the bevel gears also used again next to transfer the rotating mechanical shaft back to the horizontal axis. Then combination of bevel gear and sun-and-planet gear will be used at the third step to collect the entire mechanical rotating shafts of each wind turbine towers in to rotating shaft that is perpendicular to each incoming horizontal shaft which comes from the individual tower. Then this shaft will be connected to one gear box which finial be connected to a one generator.



Figure 3 – the new wind turbine layout or alignment

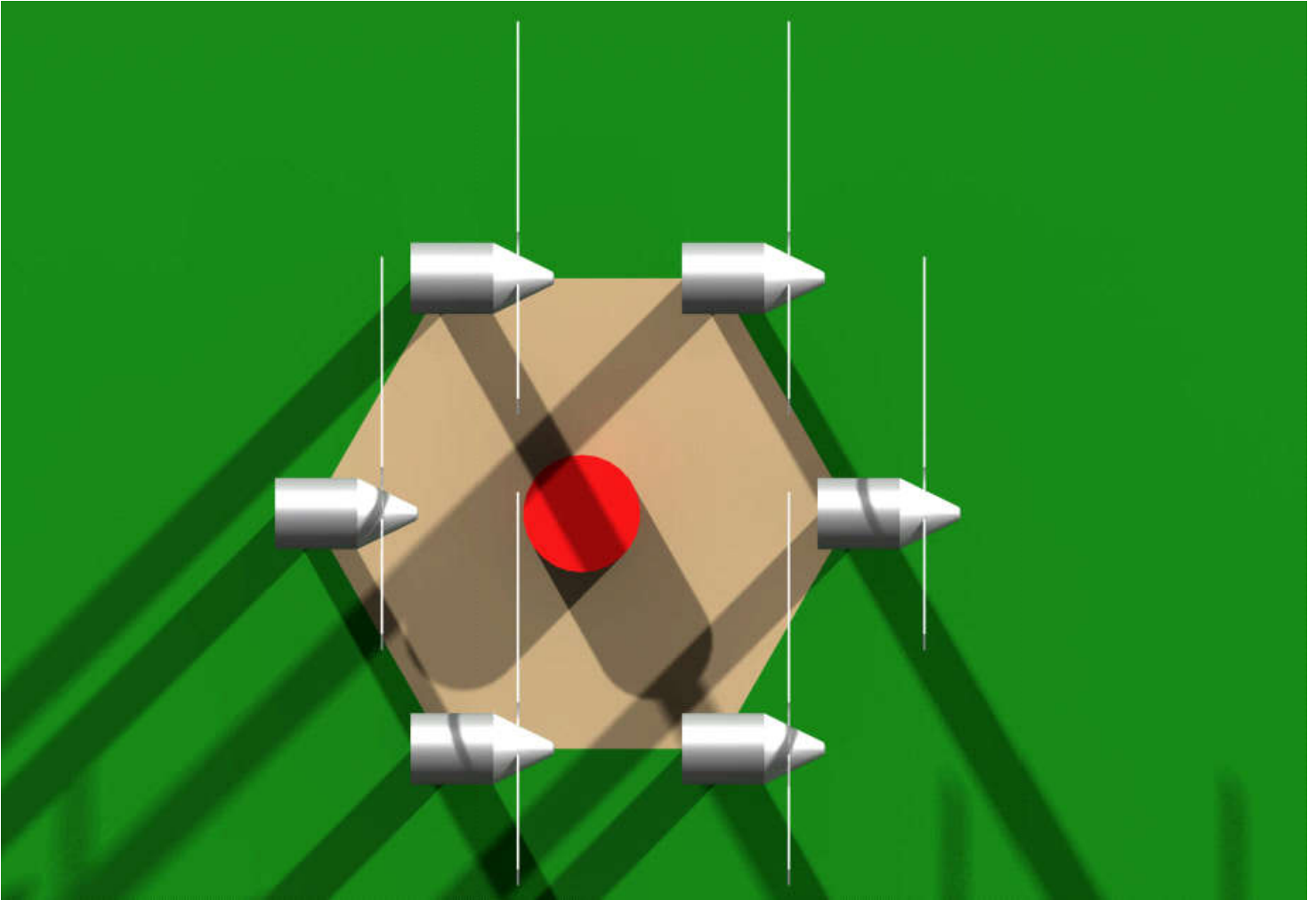


Figure 4 – the new wind turbine layout or alignment – top view

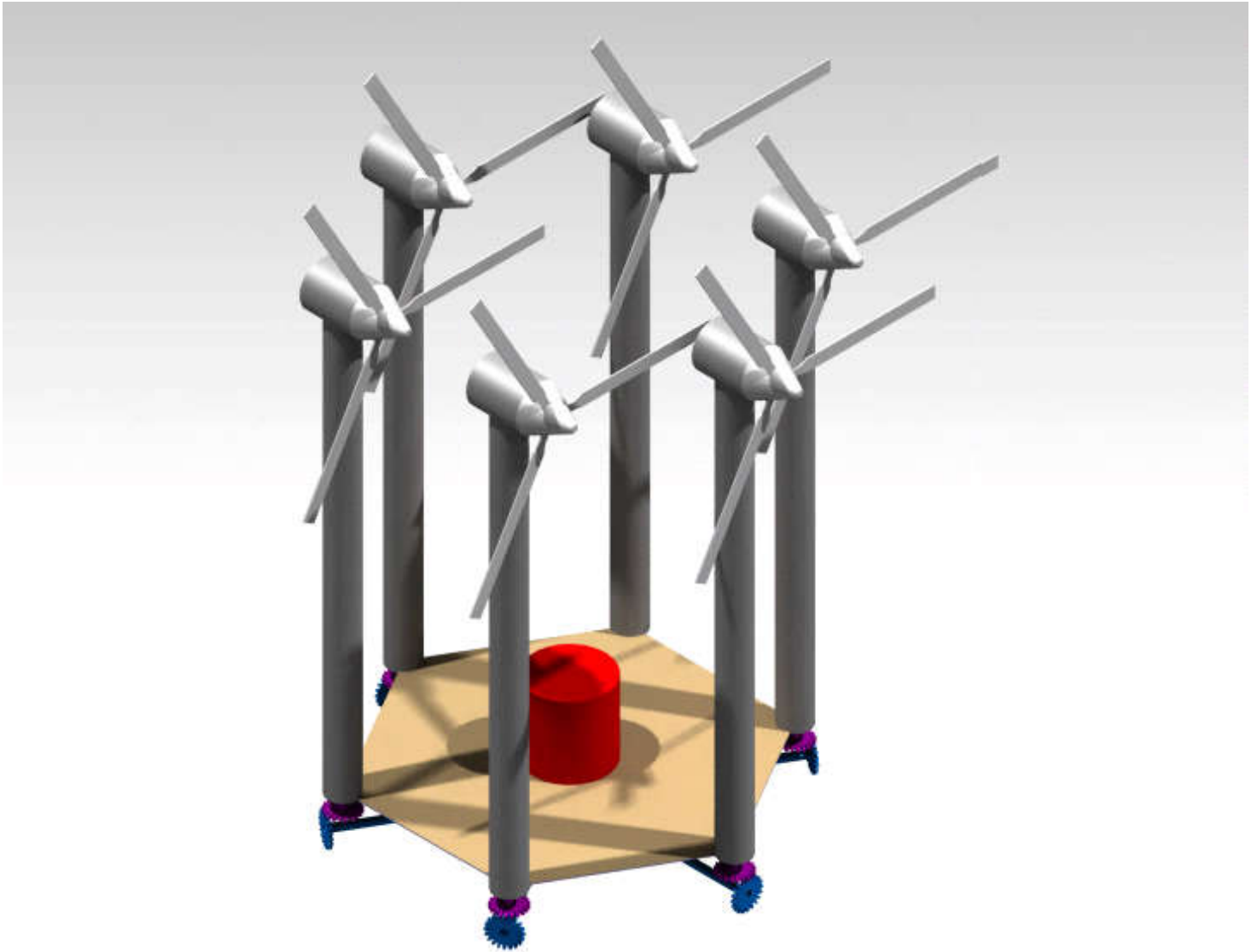


Figure 5 – the new wind turbine layout or alignment

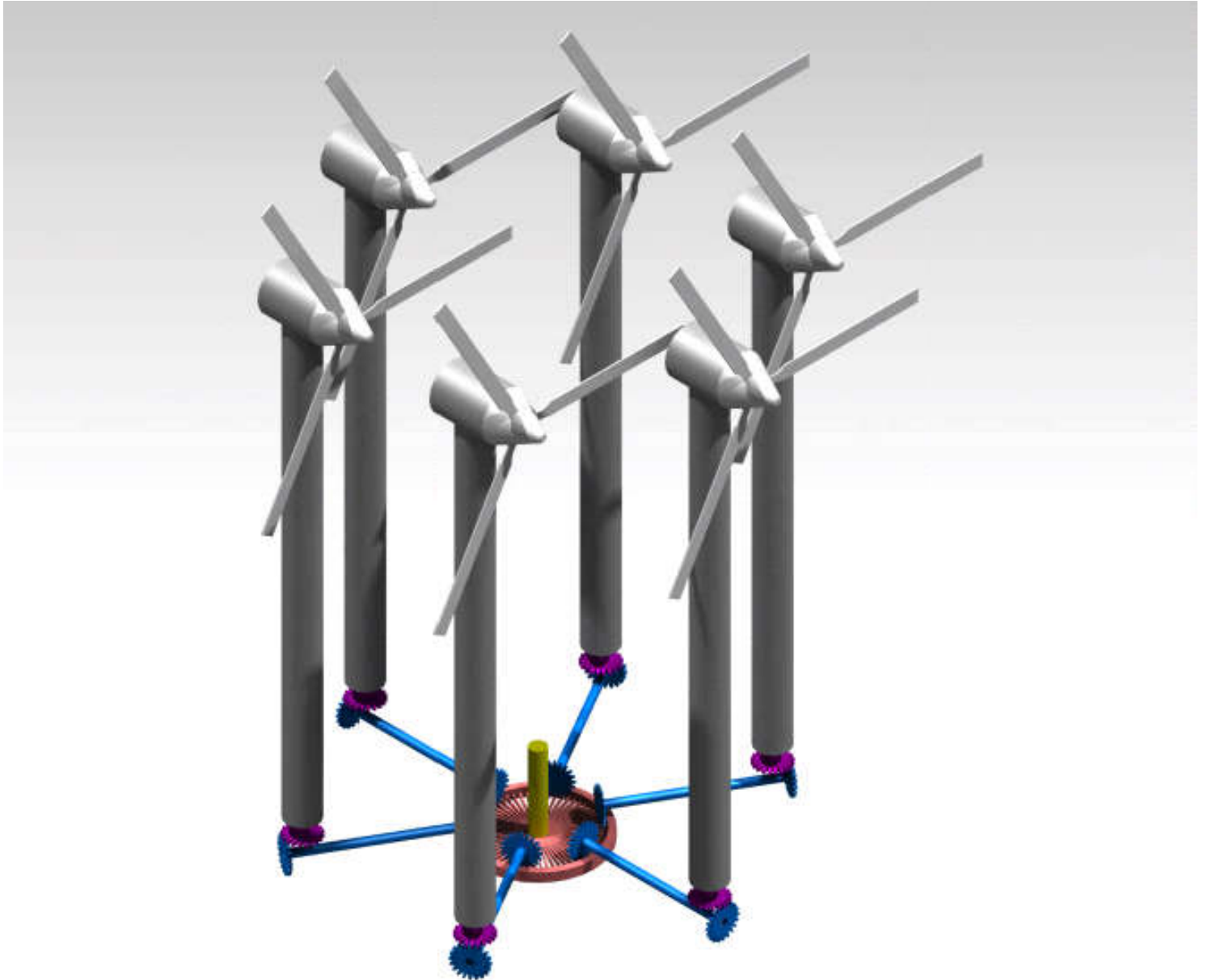


Figure 6 – the new wind turbine layout or alignment

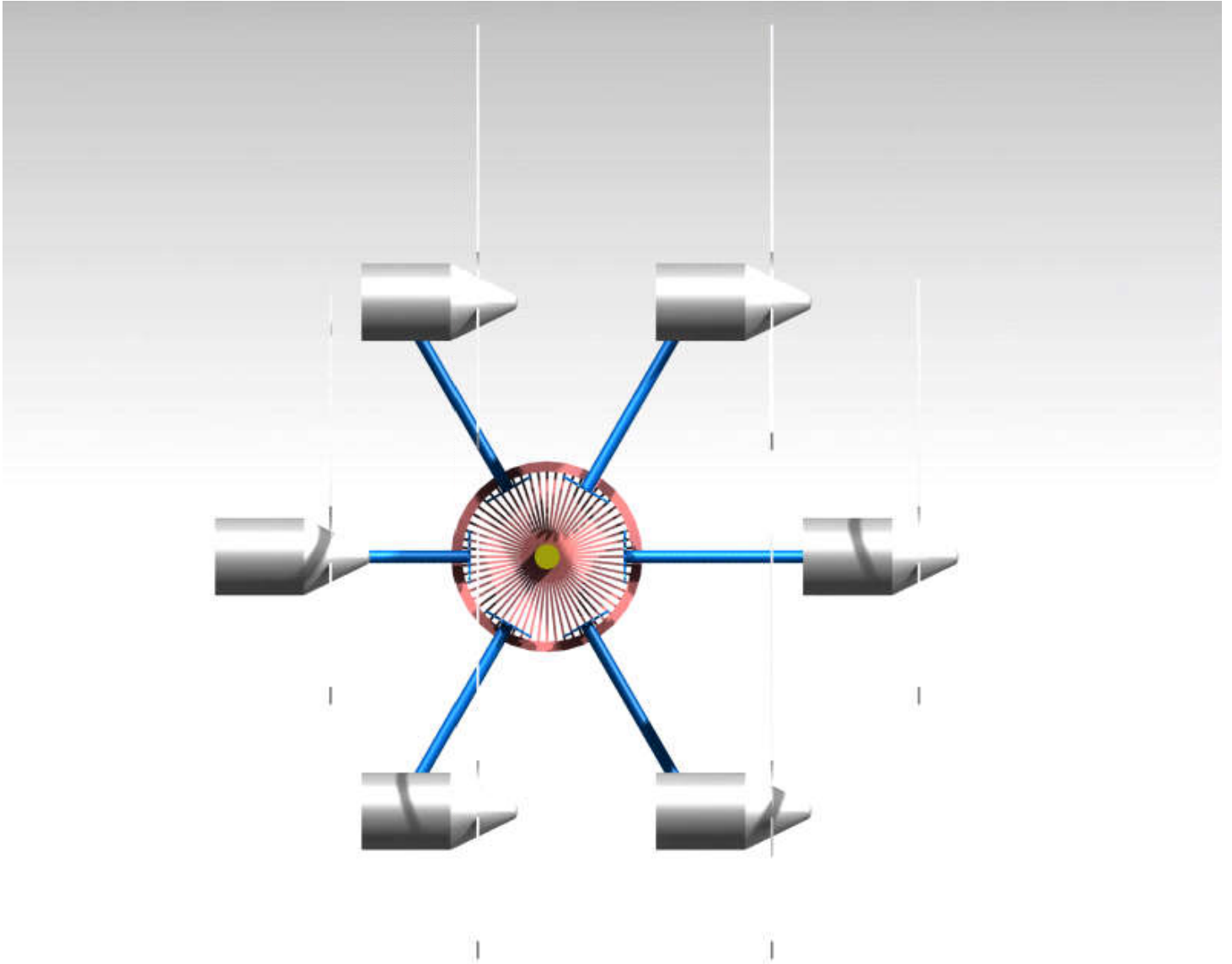


Figure 7 – the new wind turbine layout or alignment

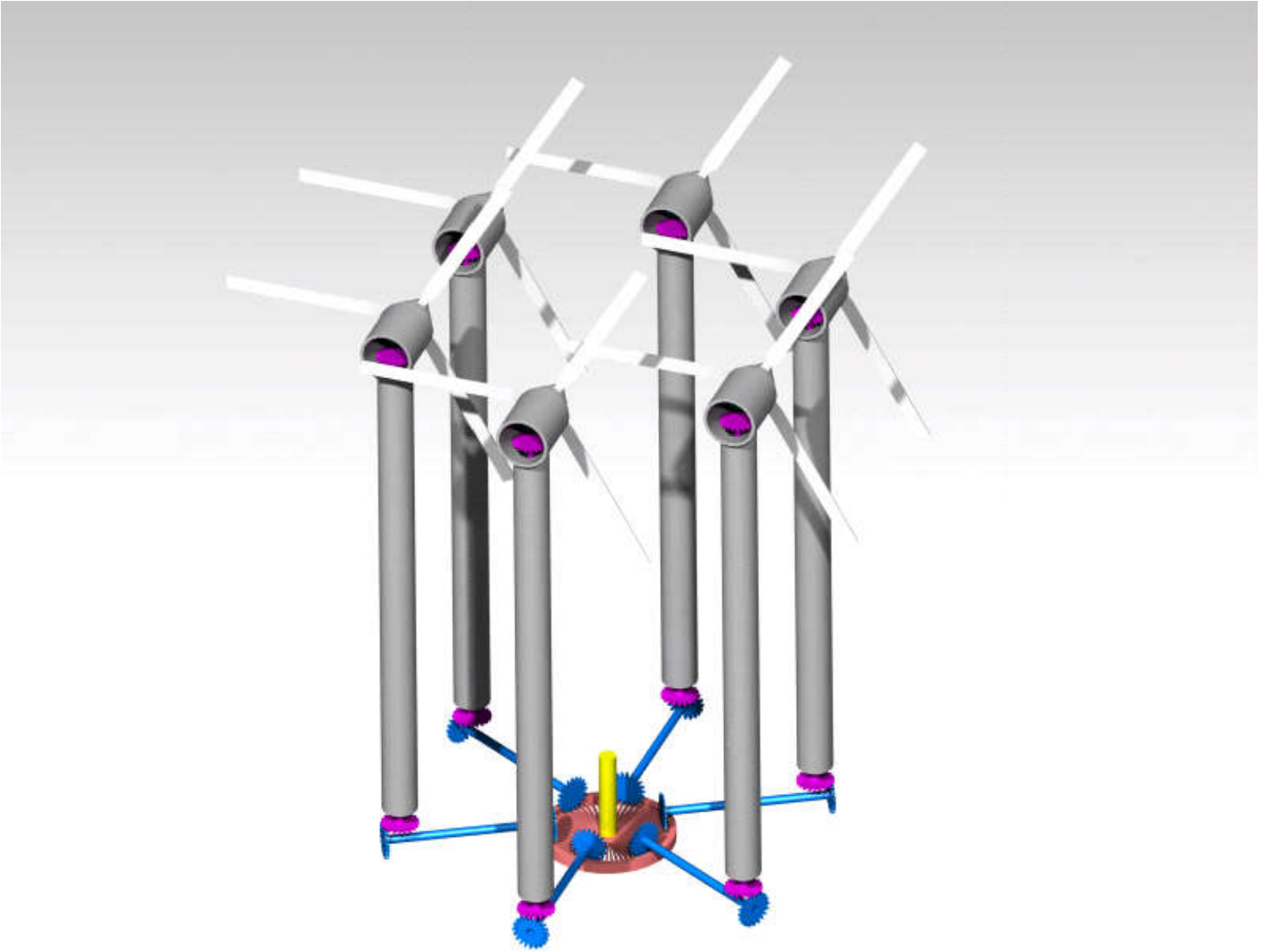


Figure 8 – the new wind turbine layout or alignment



Figure 9 – the new single wind turbine design



Figure 10 – the new single wind turbine design

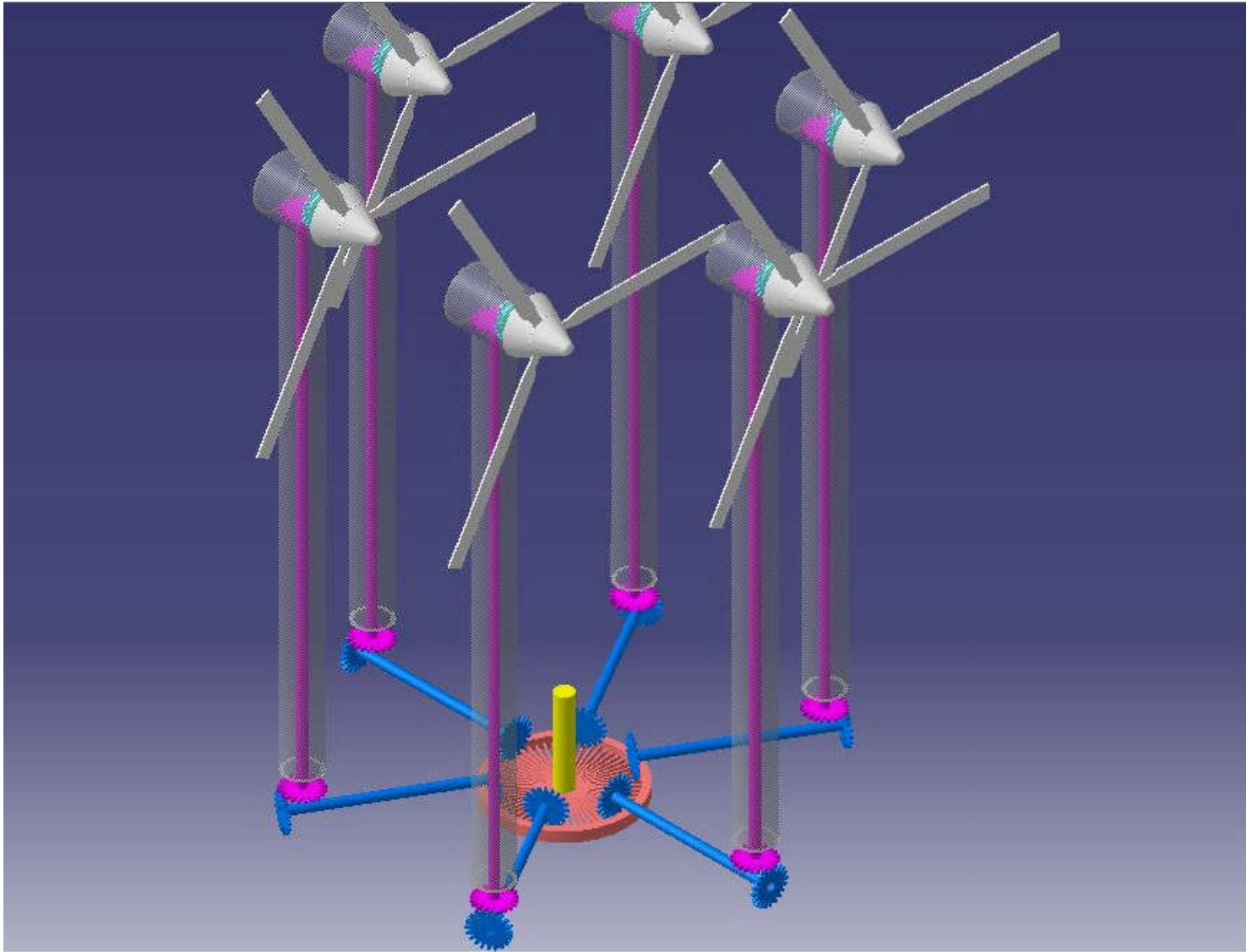


Figure 11 – the new wind turbine layout or alignment

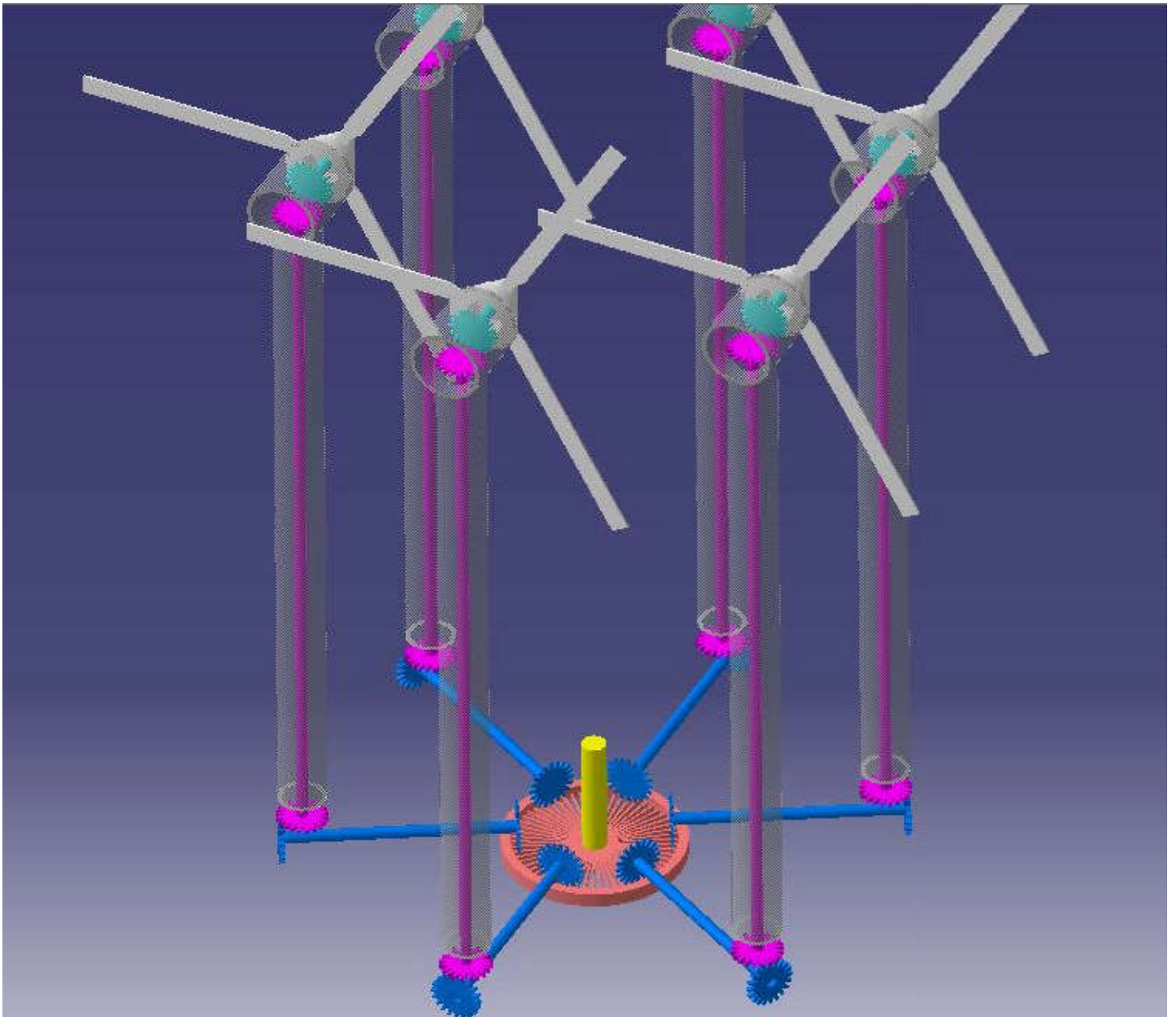


Figure 12 – the new wind turbine layout or alignment

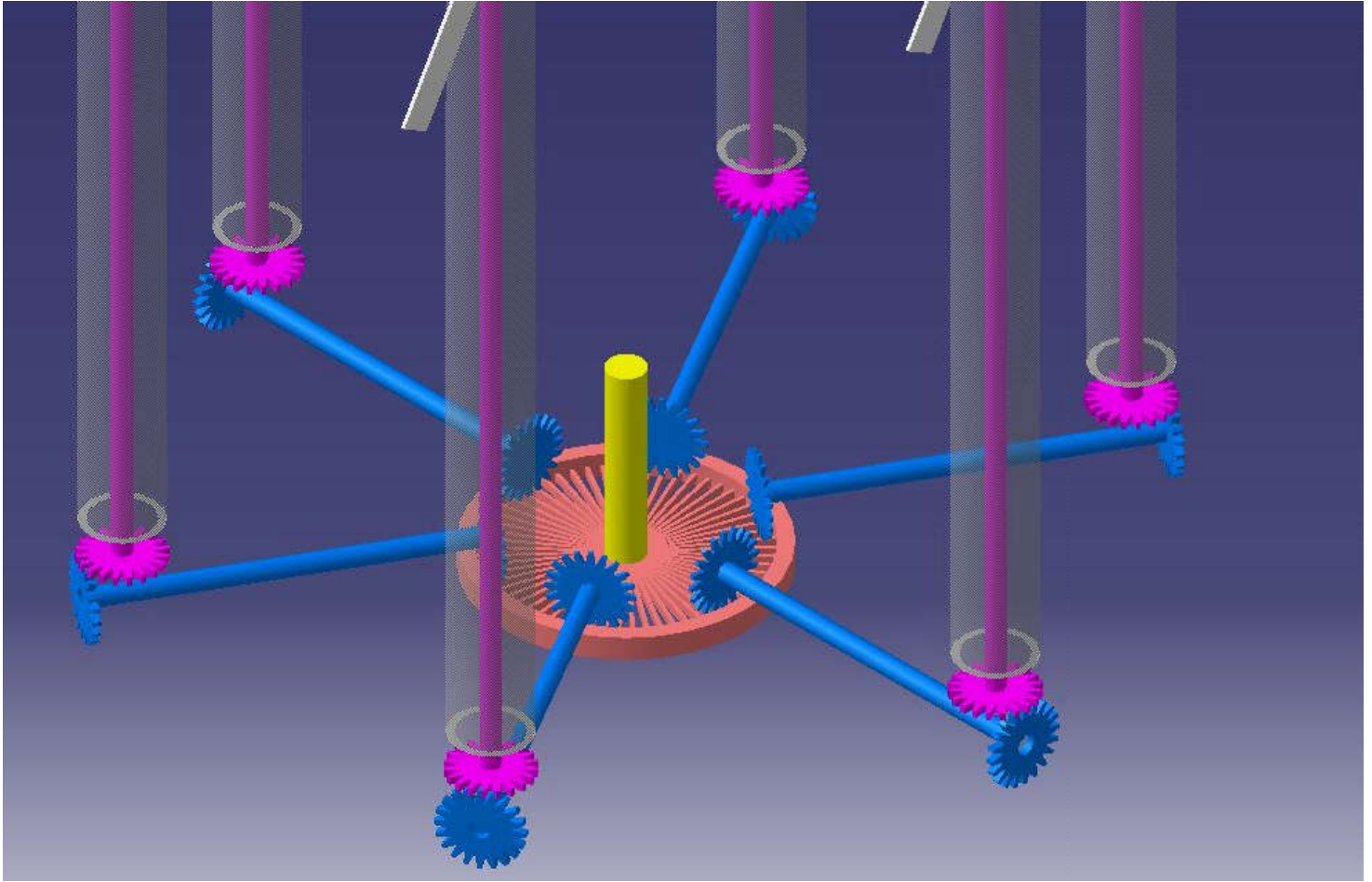


Figure 13 – the new wind turbine layout or alignment

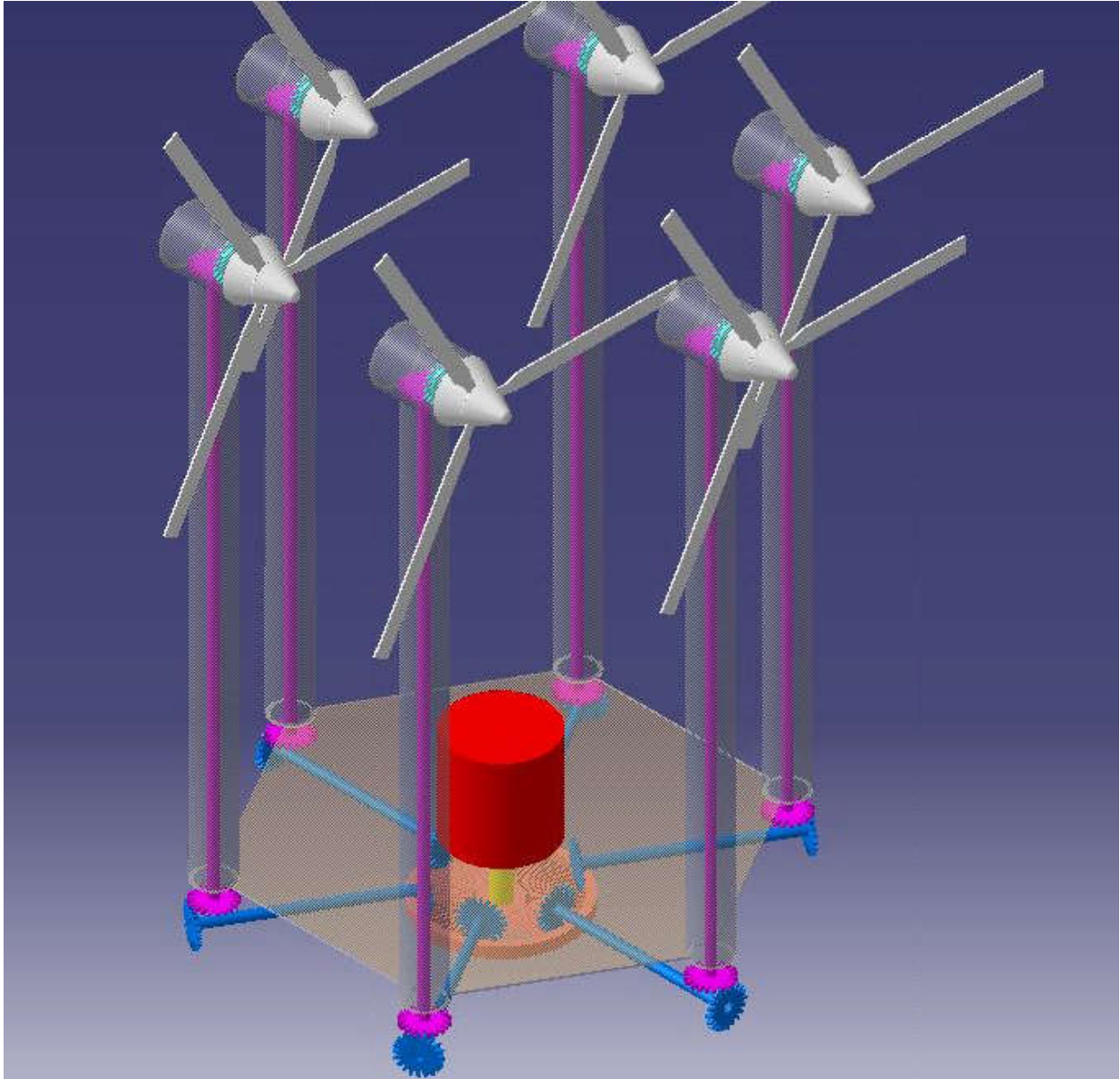


Figure 14 – the new wind turbine layout or alignment

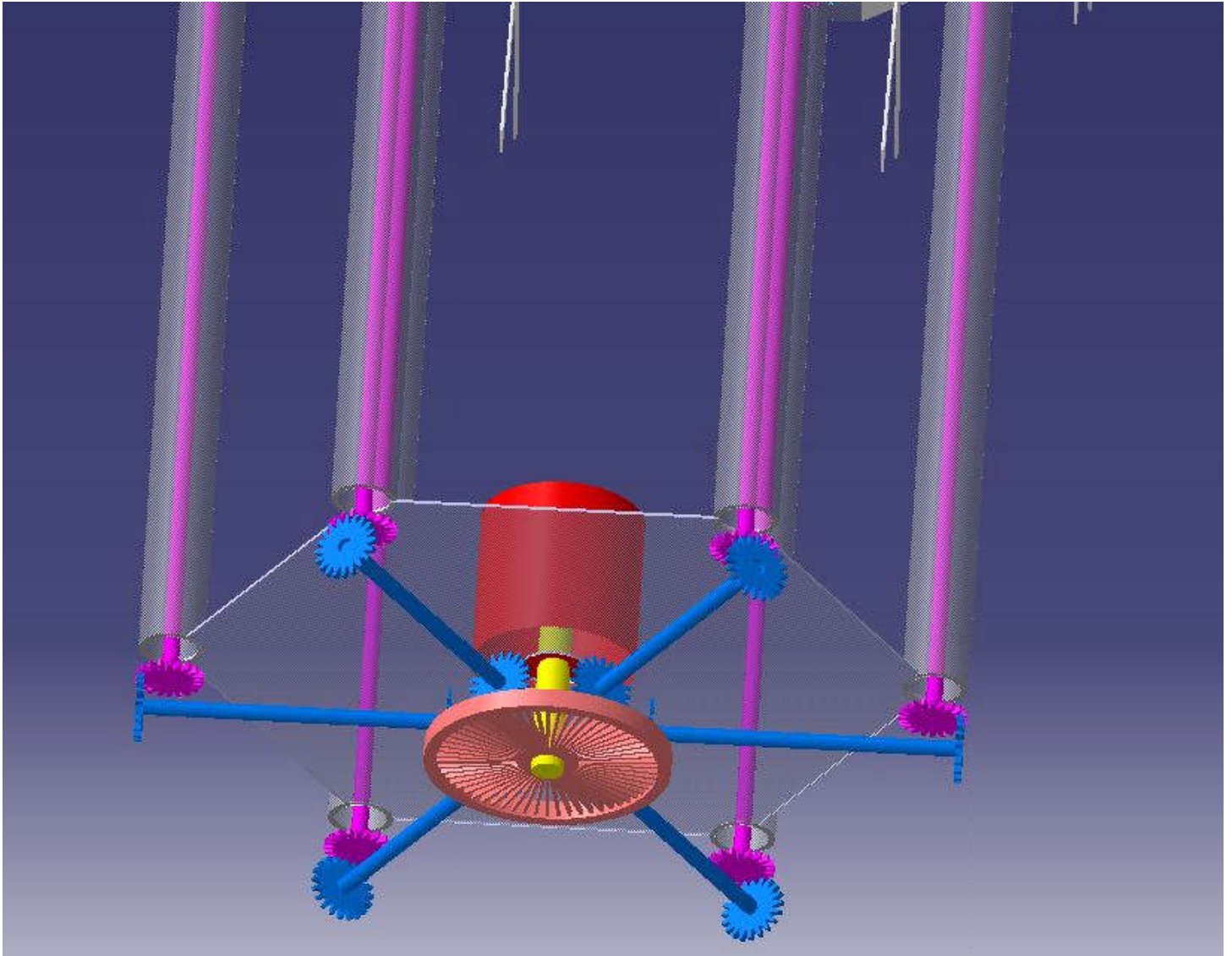


Figure 15 – the new wind turbine layout or alignment

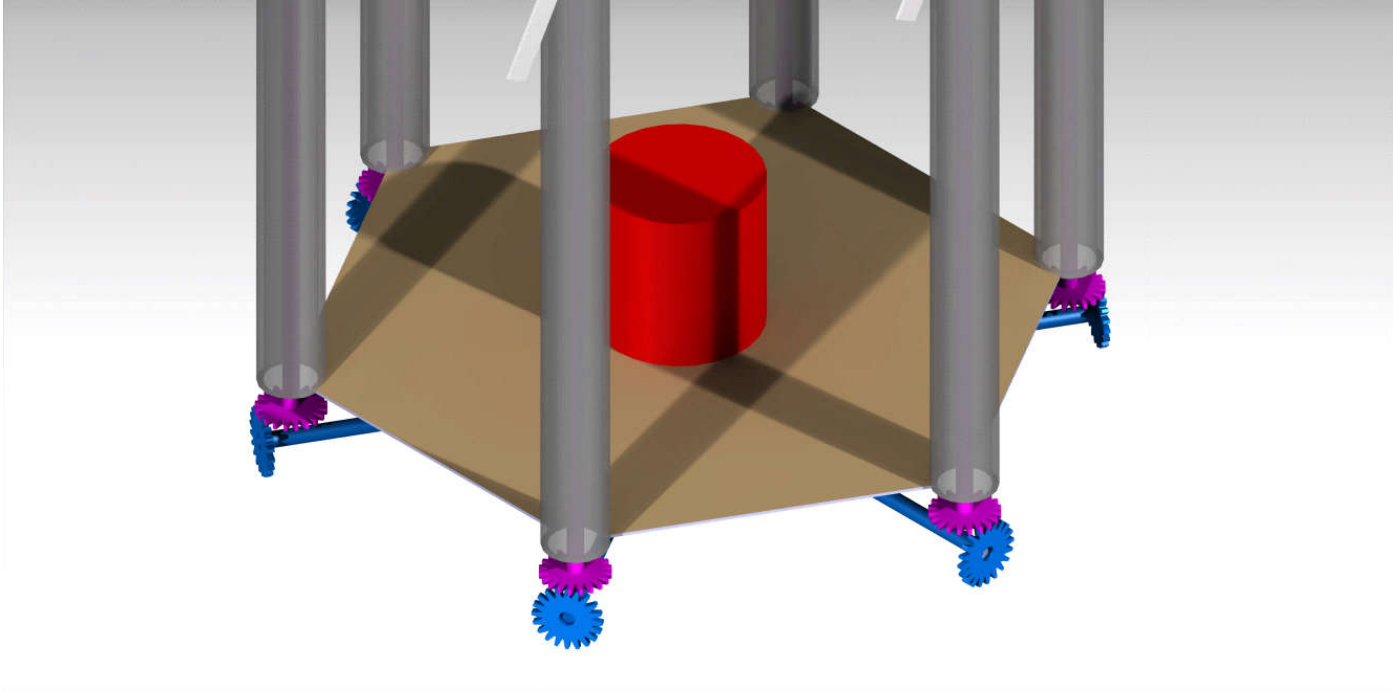


Figure 16 – the new wind turbine layout or alignment

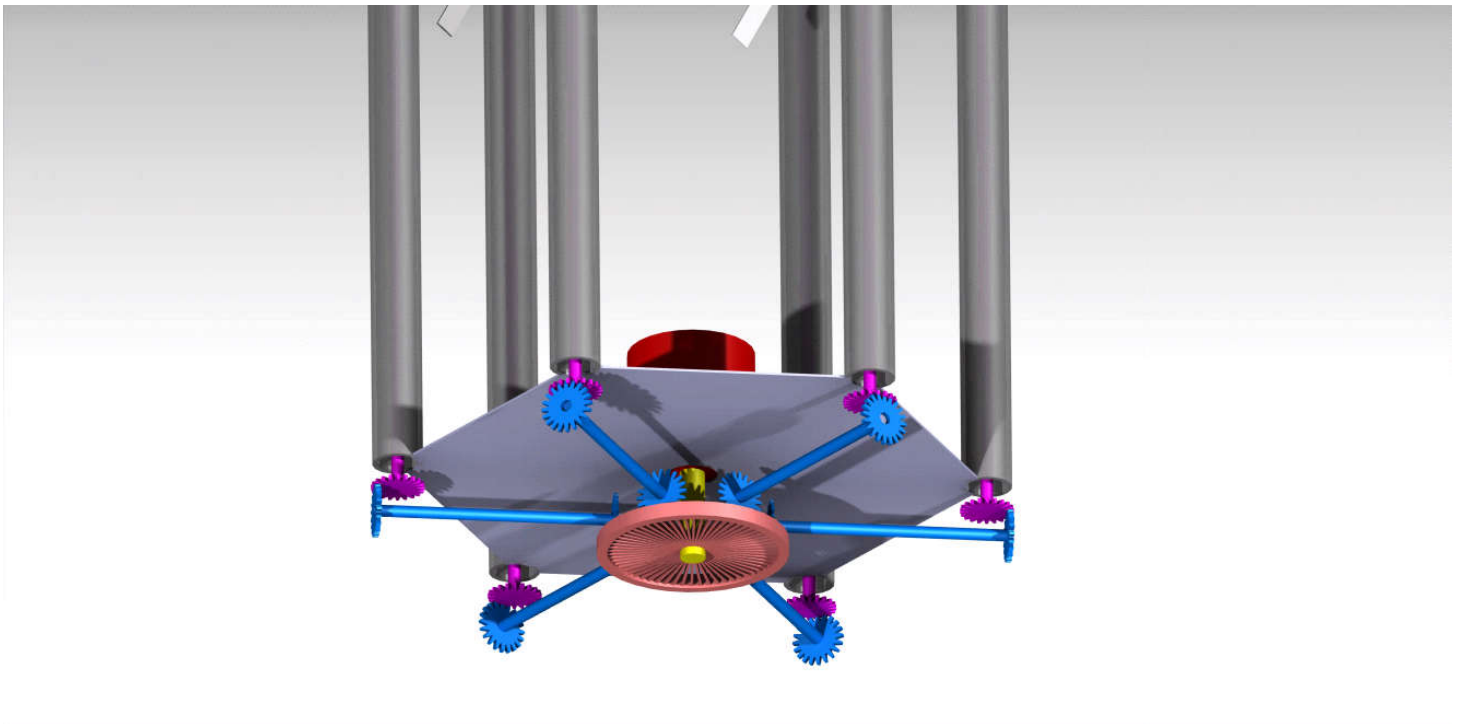


Figure 17 – the new wind turbine layout or alignment

Inventor profile

To say few words about my background, I have dedicated my life for invention and research because not only I have big dreams but also it is my only way out of poverty. We all have a talent we know or did not find out yet. Mine happens to be inventing. I discovered this talent of mine when I was in second year student during my university life. Starting from that point everything seemed not important except creating new ideas. So, until now I have invented more than 70 inventions.

You can find some of my inventions via

<https://contest.techbriefs.com/profile?user=89682>

<https://www.herox.com/crowdsourcing-community/antenehgashaw-123126>

<https://desall.com/User/AntenehGashaw/Portfolio>

<https://challenges.openideo.com/profiles/antenh.g/contributions#recent-contributions>

My latest big international honors are

- Winner of Mechanical maker challenge by NASA/ JPL- 2019 with my design invention “Mechanical eye”
- Finalist for the TIC AMERICAS 2020 competition with my project “Caribbean Sargassum Problem” project
- Finalist in TKF plastic innovation challenge 2019 with my invention “Smart green washer”
- Top 100 inventions of 2019 by create the future contest by tech briefs with my project “Cone solar panel”
- Top 10 winner of TIA challenge 2019 with my multiple unique solutions and invention
- Finalist in Enel challenge on MV & LV distribution challenge 2019 with my invention “Turbine for avoiding birds in MV & LV distribution lines”

I believe that I have made many contributions to science so far and just to mention some,

- In the recent Hawaii natural problem challenge which is the saving the Ohi'a challenge (<https://conservationx.com/challenge/invasives/ohia>), I submitted more than 30 possible solution which you can see via <https://conservationx.com/challenge/invasives/ohia/projects>
- I have developed more that 20 inventions for solution, management and prevention of the Coronavirus (COVID-19) which you can see via <https://solve.mit.edu/challenges/health-security-pandemics/solutions/22229> or <https://contest.techbriefs.com/profile?user=89682>
- I have designed a Green- technology that will solve the micro fiber problem in the oceans which you can see via <https://2019.spaceappschallenge.org/challenges/earths-oceans/trash-cleanup/teams/the-saviors/project>
- I have designed a Green- technology that will solve the micro Plastic problem in the oceans which you can see via <https://contest.techbriefs.com/2019/entries/medical/9465>
- I have many contribution for agriculture industry with my multiple project like <https://challenges.openideo.com/challenge/food-system-vision-prize/open-submission/isolation-farming>
- I have contributed to Teraforming Mars with my project Melting mars polar ice cap <https://www.globalinnovationexchange.org/innovation/melting-mars-polar-ice-cap>
- I have contributed on reduction of plastics in packaging in beverage industries with my project bottle belt <https://contest.techbriefs.com/2019/entries/sustainable-technologies/9466>

- I have invented a mechanism that will solve the hurricane crisis of the USA for good and I am looking for a department to submit my white paper which you can see via <https://www.herox.com/ideas/128-solving-us-hurricane> and few of my honorary certificates are shown below.



Figure 27 – NASA / JPL winners' certificate

Certificate of Achievement

This Certificate of Achievement Presented to

Anteneh Gashaw

*Recognizing your submission as a Top 100 Entry in the
Create the Future 2019 Design Contest*

Cone Solar Panel

Presented
November 2019


Joseph T. Pramberger
President, Tech Briefs Media Group

Figure 28 - Certificate of achievement for top 100 inventions of 2019



Awarded to:

Caribbean Sargassum Problem

For your participation as a Finalist of the Caribbean Innovation Competition during the Talent and Innovation Competition of the Americas (TIC Americas 2020).

Washington, DC, United States of America, July 2, 2020.

Luis A. Viguria
Chief Executive Officer
Young Americas Business Trust

Valerie Lorena
Executive Director
Young Americas Business Trust

Figure 28 - Certificate of participation for the TIC AMERICAS 2020 contest final