

1. If the tower is 100 feet high, will the base be at least 100 feet in, from the nearest edge of the roof, so that if the device happened to fall, no part of it could fall on the sidewalk or street below?

The location of the turbine in relation to any surrounding structures would be determined as part of the review process with the City. Whatever ordinances are in place for a tower or utility type structure would be followed and could dictate the final height of the wind turbine, if it is found that something less than 100 ft tall would be required and could still be feasible for the operation of the turbine itself.

Regarding tower strength, we believe that once the City has had a chance to fully review SkyDrill's engineering and design specifications, they will find that they more than meet standards expected for normal and hurricane structural stability. We know from research that at least 100 utility grade structures were damaged during Hurricane William, in Florida. This is markedly better than during Hurricane Andrew before it. This is a reflection, in part, of the evolving understanding of modeling for these types of wind loads. The SkyDrill turbine is designed to the AWEA standards under the IEC Small Wind program. This means the turbine is designed to withstand, at a minimum, 117 mph winds. The turbine is designed to withstand that wind load without the factors of safety built into the design, which actually increase its tolerable wind load to well above 117 mph. We feel, with some confidence, that this is safer than most or all of the existing utility infrastructure in Florida.

2. How far away from the device would an average person "hear" the anticipated noise? Give several examples of distance and the anticipated decibels of sound at that distance.

At this time, SkyDrill does not have noise data for the turbine. However, that data will be supplied to the City as quickly as it is determined after the SkyDrill prototype is functioning in West Texas. A vertical turbine currently being sold by Four Seasons Windpower, which is a lift-based design, claims to be 35 dB at 10 ft distance from the turbine. Comparatively, horizontal small wind turbines are usually in the 60 to 70 dB range. The most recent standard put out by the American Wind Energy Association (AWEA) states, "For wind speeds in the range of 0-25 mph, small wind turbines shall not cause a sound pressure level in excess of 60 dB, or in excess of 5dB above the background noise, whichever is greater, as measured at the nearest neighboring inhabited dwelling." SkyDrill expects to have a noise rating which will be well within this standard. One of the reasons SkyDrill feels confident about this is because their VAWT design is a drag-based design where the end tips of the turbine will never be travelling faster than the prevailing wind. To bring it into a more familiar perspective, ask yourself the last time you heard the sails on a sailboat making noise.

3. As to maintenance, will there be, on site, a Target person trained and experienced to do the maintenance, especially emergency maintenance. If not, how far away (in distance and time) is the nearest manufacturer's maintenance staff?

All maintenance expectations are the responsibility of SkyDrill. This is covered during the agreement phase with our customers. The SkyDrill system has many fault tolerances built into the turbine. Several different scenarios trigger the automatic braking of the turbine and the application of a storm lock of the entire system, including power outages or grid problems, excessive tower sway, and excessively high wind. Additionally, the turbine can and will be remotely monitored and able to send automatic system emails to SkyDrill personnel for dispatch or troubleshooting. SkyDrill personnel will be dispatched from Texas (approximately 6 hours travel time by commercial flight, including travel arrangement). Additionally, the turbine can also be halted and storm-locked using remote commands.

4. If advertising was not allowed on the facility would Target still pursue the proposal? If not, then we have nothing more to do.

We are willing to continue working with the City on this issue as suggested by City staff, separate from the approval of the concept and ideas of the placement of a wind turbine to lessen the carbon footprint of the store. However, advertising is the financial source for this renewable energy project.

5. Would Target be willing to pursue the project if its schedule was decoupled from the store itself? This proposal lacks a wide variety of critical information which will not be available for the fast track review suggested. Therefore, if they will not decouple the schedule then we have nothing more to do.

Target and SkyDrill would prefer to remain on schedule to complete approval and construction of the turbine by October, along with the store. However, we would be willing to decouple the two schedules as needed to meet the City's requirements for final approval. However, as previously mentioned, SkyDrill is pursuing this initiative with other municipalities where Target stores are opening in October, and where it appears the October time schedule could be attainable.

6. Should the Target answers to 1 and 2 indicate a willingness to continue the project then we are not pressed to develop questions. I would recommend the developer pursue the demonstration facility they have planned to develop the full technical and environmental data necessary to evaluate and get approval for a project and come back and make another presentation at that time.

We fully plan to make as many presentations as required to keep the approval process moving forward.

7. Also, if Target is willing to pursue the project the one piece of data that the City could provide the developer to make the next presentation more focused is a potential height range which might be acceptable, subject of course to further review by the regulators. While interesting, height is less a CGTF/technical issue than a question of zoning, visual and noise impacts, and public safety.

We agree with this perspective.

8. It appears that the 100 ft tower is too high for everyone's comfort (safety - fall zone issue, visual / aesthetic – rotating / moving sign issue) however the Target-Skydrill team said they were flexible. What I got out of the discussion was that the 100 ft elevation was where they modeled our wind as one of the factors in selecting the WPB site for suitability. It was also written by the City planner that Target is allowed a maximum sign height of 30 ft of which they were going to use only 10 ft on a conventional sign. My question to our planners is: irrespective of sign height code requirements, what is the highest they could build their windmill to satisfactorily address the fall zone issue? Depending on that height, we may or may not have to deal with variance from zoning regulations. My question to Target-Skydrill (will be) would they accept that height limit? My next question is: would Target be willing to remove their sign / logo from the "moving" part of the windmill in order to satisfy our "no moving sign" code requirement?

As was mentioned in the presentation to the Sustainability Task Force, the optimum height for the SkyDrill prototype wind turbine worked out to be 100 feet for several reasons based on sound engineering and design. There is some room for negotiation in this height, but that is limited based on the need to place the turbine in a good, steady wind regime. Keep in mind that the turbine is approximately 35 ft of that overall hundred foot height. As well, the machinery housing and bearings are another 15 ft of the overall height. The SkyDrill turbine is neither a ground-level, nor a roof-top technology.

With respect to the “no moving sign” code, as stated before, Target and SkyDrill are willing to continue working with the City on this and other signage issues as suggested by City staff, separate from the approval of the concept and idea of the placement of a wind turbine to lessen the carbon footprint of the store. However, if the City wishes to link the two issues together in weighing the approval of the entire concept, this would be considered by both Target and SkyDrill. However, we would encourage the City to look deeply into the origins of this particular part of the code to help us all gain a better understanding of why it is there and, in particular, why it would be strictly applied to this case as opposed to some other types of spinning signs unrelated to the generation of renewable energy.

Regarding noise issues: does the code have a noise limit (in decibels) for properties? I suspect that this is a consideration for industrial properties and not typical for commercial-retail. The obvious next question is what reasonable and defensible noise limit could be applied to this property? If we have a noise limit, then we can ask Target-Skydrill to meet it and monitor their windmill for compliance and they can submit reports demonstrating that compliance. If this is all something to be studied once deployed, then the City must give themselves an opt-out for removal of the windmill if it is determined too noisy by a standard both parties can agree to beforehand. Skydrill did say their windmills are quiet.

We will defer to the City to tell us if there is some type of existing standard. Also, please refer to the answer given above for question #2.

10. Steve Scherer’s question about decoupling the windmill project from the retail construction project is good for time reasons. We need more time and information to make a thoughtful and intelligent recommendation to the Mayor. That was one of my questions too.

We will work diligently to provide this information.

11. Steve Corson’s power generation simulation discussion was interesting. It brings up the question of what their expected power demand is and what is “not” conventional about this retail store’s design? Target did mention a few things like less internal lighting and reflective roof coating. I am comfortable however not knowing the true power generation from this windmill and to find out as part of an urban deployment study. My thinking is that if we’re going to be a progressive City on environmental and sustainability matters then we have to allow people to innovate and study and find things out. I think it is reasonable to ask for power generation reports as a permit requirement. The windmill should be required to generate power as a condition of its continued operation. The City should require the removal of the windmill if it is not generating power.

We would not object to power monitoring, as long as it is clear that it is a reporting burden placed on SkyDrill and not on Target, since they will have direct access at all times to the information generated by the electronic components of the turbine. As mentioned in previous meetings with the City, this could even include some type of real-time display within the store for the benefit of Target’s guests. However, it should be noted that there will be some times when the wind turbine will not be generating due to either low wind, or because it is locked down due to high wind (in the interest of public safety). If the expectation of the city is overly strict, then there really is no need for us to proceed any further. This is the nature of wind power. The estimate of offsetting 10% of the store’s electricity was reached based on an assumption of 30% efficiency from the turbine averaged over a calendar year. There could be more output, but we will not know until the turbine has had performance history at the site. In the future, SkyDrill would like to explore linking the turbine to one of the emerging storage technologies to give a timed release of electrical output during peaks. This would have a greater impact on the store’s energy profile and would be more beneficial to the grid.

This would also be a good place to answer another question about interconnection to the grid. As with any distributed energy technology, there are questions about the safety of the grid and mitigating any unwanted transmission when the grid would be unable to accept it. This is one reason SkyDrill designed their system with an induction type generator rather than a permanent magnet type. The induction type generator actually requires a tiny induction current from the grid to operate, and therefore would not be prone to this safety issue as it would be completely off-line lacking that current from the grid. In this case, the SkyDrill turbine would also automatically be locked down to keep from burning out the other mechanical parts. This is one example of the many safety factors that have been thought through in the design of the SkyDrill wind turbine.

12. Last question is how the City is going to monitor the impact to birds and bats? Skydrill has stated that they are avian friendly. It would be incumbent upon the City to require (at a minimum) bird strike reporting as part of the permit and deployment study with an opt-out if it is determined the windmill is not avian friendly.

In order to best answer this question, we would like to refer the Task Force to an article on the AWEA website concerning bird mortality and wind turbines (<http://www.awea.org/faq/sagrillo/swbirds.html>). We cannot foresee or claim to know that there will be no bird deaths due to collision with the SkyDrill turbine, or at least any more so than with other man-made objects. We do not believe this will be a major concern for many reasons, but chief among them is the relative speed of the turbine blades. As mentioned previously, the speed at the tips of the turbine blades will never exceed the prevailing wind speed.

13. All this brings up the overarching question of the City's willingness and ability to administer permit reporting requirements placed on businesses that wants to move on green initiatives, like what Target and Skydrill are doing here? One business is easy enough to manage but what happens when there are ten or (hopefully) one hundred businesses that need regular monitoring for some "green" permit requirement? How do we encourage businesses to innovate without smothering them with requirements?

We look forward to engaging the City of West Palm Beach in a vigorous discussion on this exact point.