LAGI2019 ABUDHABI renewable energy can be beautiful

LAND ART GENERATOR
RENEWABLE ENERGY CAN BE BEAUTIFUL

LAGI 2019 Abu Dhabi Q+A: Version 6 (April 21, 2019)

SCROLL TO THE BOTTOM TO SEE THE MOST RECENT QUESTIONS.

A revised design site boundary is now available with more accurate information from the latest Masdar City master plan. It has been saved as AutoCAD v.2000. The PDF provides dimension strings in meters:
https://landartgenerator.org/lagi2019/LAGI2019-DesignSiteBoundary.zip

Additional files are also available in the supporting documents ZIP file, including the original PDFs of the Masdar City master plan and land use plan as provided by Masdar City planning:
https://landartgenerator.org/lagi2019/LAGI2019-Supporting-Documents.zip

The Supporting Documents ZIP (link directly above) also contains a file named "Climate-Data.xlsx." This file now includes an additional tab with actual solar irradiance measurement data recorded by Masdar Institute of Science and Technology.

1. Q: I saw the area of intervention from your plans and documents and noticed the presence of a parking lot within. How should we consider it?

   A. Please assume that the parking does not exist. It is only there temporarily.

   A future update will show the masterplan with the intended future use, which is 100% open space in the site boundary area.

2. Q: If a university tutor asks his class to create LAGI competition entries as a component for his design studio class (part of a University degree), would that then render those entries ineligible for the competition as per the LAGI guidelines?

   A. University class studio designs are 100% eligible, as long as they meet the requirements of the design guidelines.

   A significant percentage of LAGI competition entries come from university coursework. The winning entry to LAGI 2018 Melbourne was a collaboration between RMIT students and professional practices. In 2012, when LAGI held the competition for New York City, both the first place and third place teams were students working under the same professor at Georgia Tech University.

3. Q: Would you please notify us how much is the registration fees?

   A. There are no registration fees for LAGI 2019. Participation is free.

4. Q: In the competition design brief there was not any information about solar desalination, while harvesting drinkable water was the main idea of some previous winners. I want to know are ideas about solar desalination and harvesting drinkable water acceptable for 2019 Abu Dhabi competition?

   A. At LAGI we recognize that energy and water are fundamentally interconnected, especially in parts of the world such as the United Arab Emirates where conventional desalination technologies continuously consume vast amounts of energy. We therefore welcome proposals that provide drinking water as a resource in addition to or as a first use of some of the clean energy generated.

   Please note that the design site is not in close proximity to a surface liquid water source. The LAGI 2016 design competition for which many of the proposals incorporated sustainable desalination or water harvesting technologies took place for a coastal site. The inland nature of the LAGI 2019 site will limit technologies to Atmospheric Water Generation or other means that do not rely on coastal proximity.

5. Q: Are you asking for the expected energy amount which can be produced by the work.

   A. There is no minimum requirement for quantity of energy generated by your artwork. Within the limits of the conceptual nature of the design detail, we ask that you provide in your written narrative a reasonable estimate of how much energy could be expected to be generated using the conversion efficiency and capacity factor of the renewable energy technology or technologies that you incorporate into your design.

6. Q: Do you plan to realize some of the designs?

   A. While Masdar City plans to look into the top 25 for future opportunity or future build projects, this stage of LAGI 2019 is an ideas competition with a cash prize and no promise of construction. It is possible that a project may be chosen for realization at a later date and/or that a second stage invited competition may take place to develop stage one concept designs further.

7. Q: Are you looking for solutions which can be realized now with current energy sources or are you rather looking for advanced technologies which are available in the near or mid future.

   A. Ideally your solution can be realized within the next five years with proven technologies. The science behind your solution should be well understood and proven in proof of concept testing if not in large scale implementation.

8. Q: Are there any height restrictions?

   A. Keep in mind the proximity to the Abu Dhabi airport which limits building height. For more information about this see the Abu Dhabi 2030 plan, page 93: https://www.ecouncil.ae/PublicationsEn/plan-abu-dhabi-full-version-EN.pdf (also included in supplemental downloads).

   A good benchmark to look for maintaining a cohesive urban plan is the height of the wind tower that was constructed as a part of phase one of the masterplan to naturally cool the courtyards below. The top of the wind tower is 45 meters.

9. Q: Which of the following four considerations are most important to Masdar? 1. beautiful artwork, 2. quantity of energy generation, 3. capital cost, 4. financial return on investment (grid-purchased kilowatt hours are relatively inexpensive in the UAE).

   A. Please refer first and always to the selection criteria:

      Adherence to the Design Brief; The integration of the work into the surrounding environment and landscape; The sensitivity of the work to the environment, and to local, and regional ecosystems; The estimated amount of clean energy that can be produced by the work; The way in which the work addresses the public; The embodied energy required to construct the work; The perceived return on capital investment of the work, judged by the complexity of the design in relation to the energy it produces each year; And the originality and social relevance of the concept.

   Quantity of energy production is an important consideration to be weighed fairly with the conceptual and aesthetic merit and cultural relevance of the artwork. Whereas public art and creative placemaking are fundamental to the LAGI 2019 challenge, the term "return on the capital investment" should be considered in a broad cultural context to include many other variables (beyond the cost of electricity or on-site demand reduction in kilowatt-hours) which themselves can contribute to the bottom line and viability of sustainable developments and the surrounding cities in which they are located. These variables include but are not limited to: increase in footfall

traffic, ecotourism, education, public relations, cultural value, and increase in quality of life for city residents. A high nameplate capacity is a benefit to the evaluation of any given proposal, but it should not come at the expense of public's enjoyment of the public realm of the city. The technology employed should contribute positively to the aesthetic and cultural value of the public space.

10. Q: Does the installation have to be built on ground or can it be under ground?

    A. We do not want to restrict creativity, but as a work of art in public space that is intended to engage the public, your installation should most likely exist primarily above grade. There may be many reasons why you might break the ground plane or propose elements of your installation below grade, including but not limited to foundations, balance of systems, other equipment to which you would like to restrict access, and civil engineering works (electrical transmission, etc.). The site is within the area of coastal aquifer with a relatively high water table.

11. Q: What kind of renewable energy technology is considered to be most efficient within Masdar?

    A. We do not want to restrict innovation or steer anyone towards a preferred renewable energy technology. What we can say is that, based on the prevalence of renewable energy installations within the UAE, it is various types of solar technology that have been implemented most often. Still there are many ways besides the photovoltaic effect that the energy of the sun can translate into useful energy.

12. Q: Is the technology used in the winning entry going to be tested?

    A. Should your proposal be selected by Masdar for consideration to build, it would most likely be subjected to a feasibility assessment stage that might include prototyping on site.

13. Q: Is the area (Masdar) suitable for locating geothermal resources?

    A. Phase 1b of Masdar Institute includes energy piles within the sub-structure that take advantage of the high water table as a heat sink utilizing a water source heat pump system that assists in the air-conditioning of the residential apartments. More information can be found at the following link: http://www.masdarcityfreezone.com/masdar261/static/pdf/explore_masdar.pdf

    As far as we know there is not local access to high temperature geothermal resources typically associated with dry steam, flash steam, or binary cycle geothermal power systems.

14. Q: What are the proposed buildings surrounding the site?

    A. Please refer to the updated site plan for more information.

15. Q: What type of solar panels work efficiently under the climatic conditions of Masdar? Panel testing is ongoing can you share the results?

    A. Unfortunately, we are unable to share detailed results of the panel testing that is currently ongoing and not yet published. Researchers at Masdar Institute of Science and Technology and collaborating institutions periodically publish their own papers related to the subject and we recommend that you look up the literature that is available.

16. Q: Can we use futuristic technology that will come to market in about 10 years?

    A. Ten years should be considered the limit in terms of selecting technology that has a strong likelihood of being market-ready by that time if it is not so already.

17. Q: Can we design a building, or does it necessarily have to be a three-dimensional sculptural form?

    A. Your proposal can include building components but should be primarily considered a work of sculpture. There is no requirement that your design incorporate any enclosed, conditioned, or even occupiable spaces.

18. Q: Are there any restrictions regarding how much area of land should be left undisturbed?

    A. No, as long as the site boundary is respected.

19. Q: Will an entry be disqualified if it exceeds the capital cost of $20/watt?

    A. No. It will still be considered in the selection process if it meets all other aspects of the design brief. There should be a good reason stated in your narrative as to why this guidelines was exceeded and to what benefit.

20. Q: Can the installation have a congregation space within it?

    A. Yes. Proposals that engage the public and provide places for gathering are encouraged.

21. Q: How many people are expected to congregate at any given point of time?

    A. Unknown. As an outdoor space with multiple paths of egress on all sides, there are not many technical limitations on the number of people, besides human comfort and the official decisions made by authorities related to each proposed public event.

22. Q: Can you share some information on the water management plan of Masdar city i.e. do they have a proposal in the pipeline?

    A. Masdar City is located in an area with a relatively high water table, but it is coastal brackish water that mixes with the high saline gulf waters. Utilization would therefore most likely involve some form of desalination. We know that Masdar is interested in technologies that can recycle water on site, harvest water, and reduce water consumption. We are not in possession of any strategic plans from Masdar City regarding water management, but should those be made available we will provide an update to registered teams.

23. Q: Is it possible to get data regarding the efficiency of the Wind Tower in Masdar City?

    A. We are not in possession of any of the performance data from the wind tower at this time. Should this information be made available we will provide an update and notify registered teams.

24. Q: Should there be provisions for parking vehicles on site?

    A. No. Please assume no parking within the site boundary. Currently there is a temporary lot that occupies a part of the site, but it will not be there in the future.

25. Q: In DWG plan there is a "pocket" with dimension approx. 56 / 25 meters, from North West side of the site. Is the "pocket" on the project site or outside of it?

    A. For a better understanding of the design site boundary, please see the updated site boundary document: https://landartgenerator.org/lagi2019/LAGI2019-DesignSiteBoundary.zip

    The area you are referring to is a previous approximation of proposed building parcels. This information is more accurate now that the latest master plan has been provided by Masdar City planning.

26. Q: In excel file "Climate-Data", what kind of temperature is it: by wet bulb or by dry bulb?

    A. Temperatures listed are dry-bulb readings.

27. Q: What happens with the awarded entries? What kind of recognition they receive, in terms of publicity?

    A. The top 50–60 entries will also be published in a hardcover book by Prestel and distributed widely. The book is available online and in many brick and mortar booksellers, as well as in libraries and museum bookstores around the world. Additionally, LAGI will promote the entries throughout the second half of 2019 to media outlets and coordinate with design teams directly regarding the same. Past LAGI design competitions have reached audiences in excess of 10 million and in media outlets in countries around the world (The New York Times, The Guardian, Dwell Magazine, Smithsonian, etc.). The shortlisted entries will be on display in an exhibition at the 24th World Energy Congress in Abu Dhabi and again at the 2020 World Future Energy Summit. All qualified submissions are included in the portfolio of LAGI submissions online.

28. Q: If I hire an artist to illustrate my design, is he/she going to be a part of my team?

    A: We encourage the practice of recognizing all members of a creative team. The upload area provides an "affiliation" field in which the role that each person played in the design process may be highlighted and the firm, institution, or organization they represent can be conveyed. When publishing your design, LAGI will list individual names without affiliation exactly as they are input into the submission form field unless directed explicitly in writing by a team's primary point of contact to replace individual name with affiliation (name of firm or institution). You are not required to include someone that you hire as a part of your team. This is an arrangement to be made between yourself and whomever you hire.

29. Q: Can I submit more than one proposal?

    A. Per the Terms & Conditions: "Teams may submit only one entry to the competition. Individuals may not be on more than one team." We recommend that early in your design process you look at many different ideas, but that through a process of iteration and critique, decide to carry the idea you feel is the strongest forward through concept design and submission.

30. Q: Is the restricted area solely for electrical equipment? Should it be an enclosed area?

    A. The most important consideration within this design brief requirement is human safety. The details of how safety can be accomplished will vary greatly depending on the technology employed and the form of the artwork's sculptural expression.

31. Q: Does submitting my design give the adviser, event partner or sponsor 100% ownership of my design?

    A: The design remains the intellectual property of the design team. LAGI takes this commitment seriously and takes all measures within our control to ensure that the design team is properly credited for their work. The publication is also a way for teams to time-stamp their ideas in the public domain. LAGI does not take responsibility for the protection of the IP of any design. By submitting your design, you grant LAGI a non-exclusive right to use your images and text in print and online. For a more complete answer to this question, please see page 19 (Section 13) of the Terms & Conditions.

32. Q: Does "engage the owners of proprietary technology in preliminary dialogue" means contacting the developer him/herself or will a research about the owner of the technology will suffice?

    A: If you have any questions as to whether the owner of any proprietary technology will be OK with you using their technology in your design, it is always a good idea to reach out to them. This is more commonly appropriate when the technology is still in research and development and when that type of technology it is not yet being produced by more than one product manufacturer. Research about the owner of the technology and proper credit given to them in your written narrative may in many cases be sufficient. In cases where the product is available in the marketplace (for example a solar PV module) this type of coordination is probably not necessary.

33. Q: In the Masdar city masterplan Phase 2 Detailed Master Plan (DMP) document found online: https://issuu.com/cbt55/docs/2015_10_25_masdar_phase_2_dmp_resub there is a proposal for a urban "Green finger" plaza-park in the area of intervention. Should we respect the planned park or does the contest aims for a completely new proposal that will ignore the existing plans for the phase 2?

    A: The document referenced is from 2015 and some elements of Phase 2 planning may have changed since that time. The updated supplemental documents ZIP file contains the latest Masdar City land use plan. The 2015 DMP is a good general reference to inform your proposal. The site boundary exists entirely within the OS-01 and OS-02 Open Space areas. You may feel free to propose anything within those areas. Do not feel constricted by any sidewalk or landscaping layouts within OS-01 and OS-02 that you may have seen in master planning documents. The site boundary continues across the street that divides those two areas and you may feel free to propose that your artwork extend across that space, provided that it allows a clearance height of 5 meters for safe traffic flow below.

34. Q: To calculate the cost of installation per watt I need to know the prices of some main materials / activities in Abu Dhabi as:

- concrete
- steel (for reinforced concrete)
- steel (profiled)
- formwork (labor & material)

A: Please note that the LAGI 2019 design competition does not expect a detailed quantity survey and cost estimate, but rather a conceptual estimate only (rough order of magnitude).

You may find this resource helpful, published by Turner & Townsend:
https://www.turnerandtownsend.com/media/2389/icms-survey-2017.pdf

It is from two years ago, but again, the escalation from that time is probably within the margin of averages for this level of estimation. You can adjust up slightly if you like.

Per that document, we found the following benchmarks that align somewhat to your inquiry:
- **concrete [$/m3] = $108 USD**
- **steel (for reinforced concrete) 16 mm (per tonne) = $936 USD**
- **structural steel beam (per tonne) = $1,890 USD**
- **formwork (labor & material) [$/m2] = $36 USD**

35. Q: Regarding to the site boundary, is there any flexibility in propose something that will be outside, or do we strictly have to contain our proposal within?

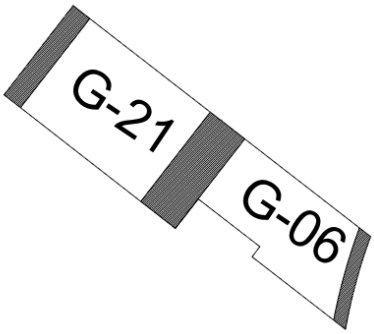
A: Please stay within the site boundary unless there is a very good reason to propose something outside of it. Your submission will only be judged by that which is within the boundary.

36. Q: There are inconsistencies between the 3D massing model and the 2D site boundary drawing. Which document should we take as primary?

A: The 2D file is the most accurate and most recent: LAGI2019-Site-Boundary-UPDATE.dwg

The 3D model is meant to provide a helpful way to establish an overall city massing, but it is from an older iteration of the master plan. The building heights are accurate in the 3D massing model.

37. Q: Are the hatched areas in the attached image below included in the total area of the site or not?



A: The hatched areas in your sketch are included in the site boundary with the following important consideration. Please maintain 5-meter high clearance when the site boundary intersects with the street to maintain safe traffic flow. You may propose ground-level interventions within the sidewalk areas, making consideration for the safe passage of pedestrians.

38. Q: Shall we provide facilities like public toilets, indoor areas such as a cafe since the sculpture will be in a plaza? Should we provide operation rooms with staff offices to monitor the renewable energy systems?

A: The design brief calls for a work of public art, with no indoor spaces. There are no programmatic requirements for a cafe or related facilities, but there is nothing restricting anyone from adding such elements to their design if they choose to do so, as long as they follow the design guidelines.

You can assume that energy monitoring may take place remotely, or you may choose to integrate such a facility into your design if that is a part of your concept.

39. Q: What kind of renewable energy technology is considered to be most efficient within Masdar? What type of solar panels work best under the climatic conditions of Masdar City? Is there additional solar and weather data available?

A: Solar energy is a very suitable technology for the region. Both crystalline and thin film solar panels perform well in Masdar City's climatic conditions. Other renewable energy technologies may also be viable. Please see the LAGI Field Guide to Renewable Energy Technologies.

An updated climate file with detailed solar irradiance measurements is available here: https://landartgenerator.org/lagi2019/LAGI2019-Supporting-Documents.zip

40. Q: You mentioned that the site is within the area of a coastal aquifer with a relatively high water table. Are there numbers on flooding statistics, specifically on how high the water could get?

    A: The water table is consistent and remains below grade. It does not rain very often in Abu Dhabi, but when it does it can cause very short duration localized flooding (less than half a meter) mostly in places where there are expanses of impermeable surfaces.

41. Q: Question 13 mentions utilizing heat sink technology for residential apartments; should there be apartment/living spaces with the building?

    A: The design brief calls for a work of public art in a civic space. The open space within which the site boundary is located is surrounded by residential and lab buildings, but you are not tasked with designing any "building" or habitable architecture, unless that is somehow a part of your artwork concept. If so it should be very limited and absolutely not residential.

42. Q: Can we be vague about what type of solar panel is used, and just say "solar panel" with height and width?

    A: Yes

43. Q: Where were the photos taken from?

    A: The below diagram provides a sample of where some of the panorama photos were taken. The four-digit numbers in red match the four-digit numbers within the JPG file names. As you can see, many of the buildings that directly surround the site boundary have not yet been constructed.

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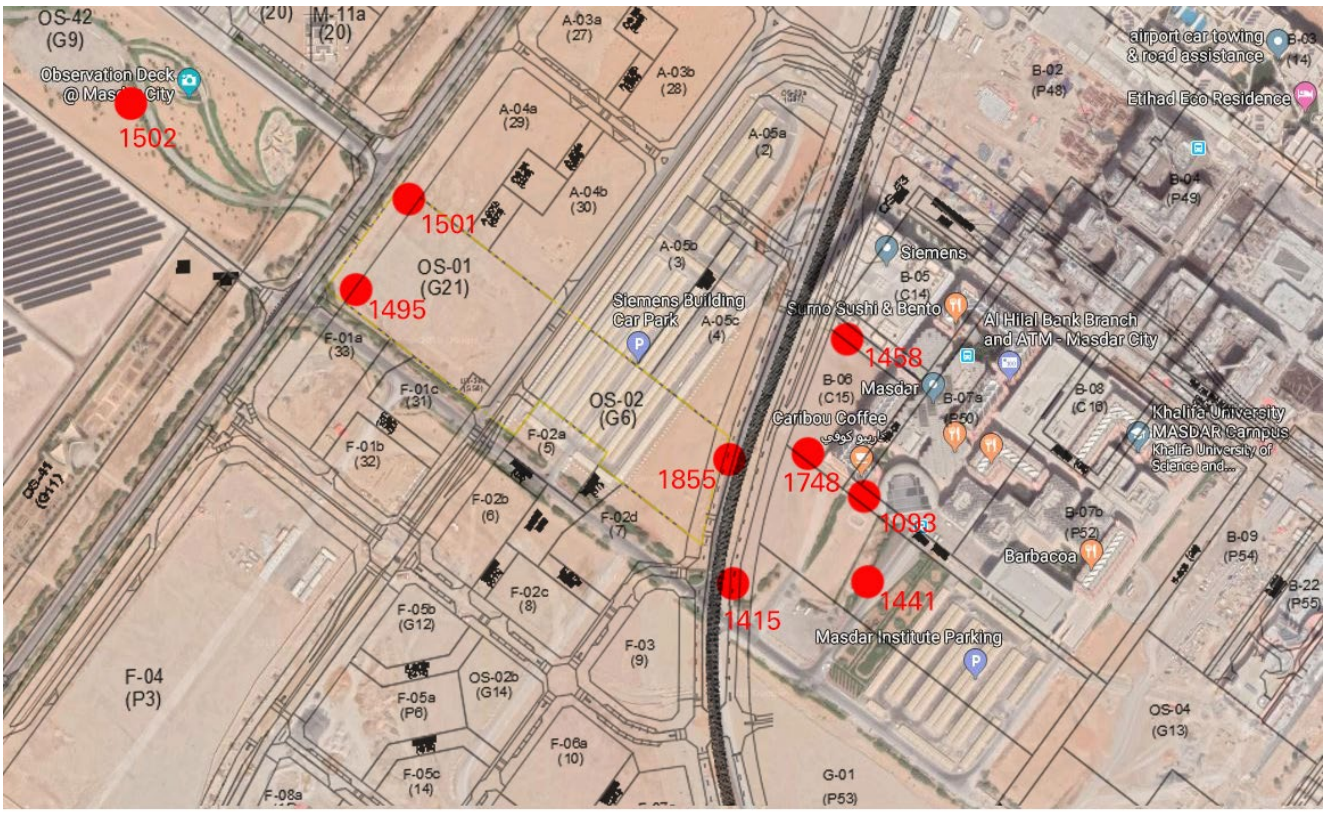

General locations of site photograph view points (representative sample, not all photos included)

44. Q: Is possible for us to come and see the site?

A: Masdar City is open to the public. From Al Shahama Road (E10) follow signs for "Presidential Flight." The entrance to Masdar City is just after the Presidential Flight roundabout. You may park at Masdar Park or the Siemens Building Car Park (which is temporary and which exists on part of the LAGI 2019 design site. You should have no trouble walking freely around the site and within the site boundary.

45. Q: Can you provide dimension lines on the PDF version of the site boundary?

A: The files have been updated on March 13, 2019 to show dimension lines in the PDF version of the site boundary.
These are located in https://landartgenerator.org/lagi2019/LAGI2019-DesignSiteBoundary.zip

46. Q: I have the questions about copyrights and I am wondering who will get the award in the case of winning the competition: Student or the University and if should I make application for the contest by me or if should it be made by University?

    A: Unless your university has a policy that governs your actions, LAGI policy is to award the prize money to the primary point of contact. This is the person who leads the design team, and/or who registers and manages the submission upload process on the competition website. It is that person's responsibility to distribute the award to the design team. In the downloads area you will also find a Terms & Conditions document that should answer any other questions you might have about the process and copyright. It is LAGI policy that the copyright and intellectual property associated with every design remains with the design team.

47. Q: Is it allowed to give a proposition where we can dig for underground water? How will it be judged?

    A: There is no restriction limiting your design from proposing such an idea. Keep in mind that the ground water in that location is brackish as it intermixes with the salt water of the Gulf. Your proposal will be judged through an anonymous process in accordance with the selection criteria listed in the design brief. For more information please refer to the Terms & Conditions document.

48. Q: May the two parts of the site that are separated by a road be connected by an underground tunnel as a part of the experience? If that option is possible, can you share the details of the depth of the underground utility trenches on the road?

    A: Yes, the two parts of the site may be connected by an underground tunnel as part of the experience. LAGI is not yet in possession of the sub-grade civil works and we recommend proceeding with the assumption that either 1. modifications can be made to your concept during detailed design to accommodate the existing infrastructure, or 2. the infrastructure that is there can be modified to accommodate your design. As you can see from satellite images, no construction has yet begun on the buildings or landscape in the area of the design site. It is therefore to be considered a blank slate.

49. Q: Is it necessary that LAGI 2019 design contain structures of events and interaction spaces as like auditorium, restaurant, cafe and etc.?

    A: Your LAGI 2019 design does not need to include any programmed spaces like the ones that you mention in your question. It is purely a work of public art that will use renewable energy technology as the media for creative expression. Please refer only to the requirements listed in the Design Guidelines PDF: http://landartgenerator.org/lagi2019/LAGI2019-DesignGuidelines.pdf. See page 17 of that document where you'll find the brief.

50. Q: Is it possible to change the vehicle road to flyover or underpass?

    A: If there is a justifiable reason that is directly related to your artistic concept for your team to take this design approach, then yes, you may propose to change the vehicle road to a flyover or an underpass. If you do so, you must stay entirely within the boundary area for your road works modifications, which, given the 90-meter overall length of that section of street will likely require a steeply inclined road to either side in excess of 1:10 or 10% grade. Please adhere to best practices of traffic design with any roadway grade or radius that you propose within the site boundary.

51. Q: How high are the buildings in the vicinity of site?

    A: Accurate surrounding building heights can be found in the 3D model available for download on the LAGI 2019 Design Competition registration site:

    https://competition.landartgenerator.org/abudhabi2019/brief/
    https://landartgenerator.org/lagi2019/Masdar-City-Massing-Model.zip

    In the area around the design site, the buildings are proposed to between 25 and 30 meters to the roof in the master plan, although they do not yet exist and so the details may change.

52. Q: The average interval between the wind and the average duration of the wind in each month?

    A: This wind rose diagram for the Abu Dhabi Airport provides wind speed data, the percentage of time for each over the course of a year, and from which cardinal direction the wind comes from: https://mesonet.agron.iastate.edu/sites/windrose.phtml?network=AE__ASOS&station=OMAA.

    We unfortunately do not have any more information on the average interval between wind gusts or average duration. The fluid dynamics of wind vary greatly by specific location and the measurements from the Abu Dhabi airport would likely not be accurate enough to provide the data you seek for the design site. The buildings that do not yet exist on either side of the site boundary will also have a great and as-yet-unknown effect on the type of gusts and lengths of wind speeds. You can expect that the new buildings will have the effect of channeling the wind and increasing its speed (Venturi effect) as the prevailing wind direction is from the northwest. The buildings may also increase its turbulence. Given these unknowns, you will need to make assumptions at this stage. Please keep in mind the conceptual nature of the design competition, which does not request detailed modeling or engineering.

53. Q: Can we write our project (concept) name on the main sheets? Or should to write the name only in proposal and information document?

    A: You may write the title of your artwork on your narrative description text file and/or on your graphic presentation boards as you choose.

54. Q: Do you evaluate sustainability of land art generators from storm damage?

    A: For how submissions are evaluated, please refer to the LAGI 2019 Selection Criteria on page 19 of the Design Guidelines document. Engineering for storm damage is not an explicit criterion for LAGI 2019, although it is expected that your artwork will be permanent (durable) and functional over a significant life-cycle as city infrastructure. Since LAGI 2019 seeks designs at a conceptual level of development, it is not necessary to perform engineering calculations or model wind effects.

55. Q: What is expected for the design to sustain storm damage, for example from category 2 (154-177 km/h) wind speeds?

    A: We ask that you use good judgement, recognizing that seasonal strong wind events do occur in Abu Dhabi, although the area is not subject to cyclones (it is protected from the open ocean atmosphere by the Al-Hajar mountain range) or to wind speeds on the order of those you list in your question.

    Refer to the climate information in the Supporting Documents ZIP File (https://landartgenerator.org/lagi2019/LAGI2019-Supporting-Documents.zip) and see this website for more information on wind in Abu Dhabi: https://www.windfinder.com/windstatistics/abu_dhabi.

    The LAGI 2019 design site is somewhat sheltered from winds by surrounding buildings, although the prevailing wind direction from the northwest may be amplified by the Venturi effect in the urban corridor created by the buildings along the northeast and southwest of the design site. Since LAGI 2019 seeks designs at a conceptual level of development, it is not necessary to perform engineering calculations or model wind effects.

56. Q: Can you please confirm if the 300-word environmental impact statement is in addition to the 1200-word design description or included within the 1200-word limit?

    A: Please consider the 300-word environmental impact statement in addition to the 1200 word design narrative. In other words, please do not exceed 1500 words maximum.

57. Q: Regarding the cost limitation, let's say I want to install 2000 solar panels and each panel has a wattage of 100 watts. How do I get my total budget? Do I have to run an energy simulation?

A: The cost per installed watt is in reference to the nameplate capacity. There is no need to consider the capacity factor. To use your example, you would have 2000 panels x 100 watts per panel x $20 per watt = $4 million total project cost, including all costs associated with the installation of the artwork.

58. Q: In question No. 37 you have answered that the hatched areas are included in the site boundary. Do you mean that the two areas on the edges of the site plan are inside the boundaries of the site or they are outside of the main site boundary?

A: The hatched areas on the two side edges of the site represent pedestrian sidewalks that are included in the site boundary. The actual road surface (everything beyond the curb) on those two sides are outside the site boundary. The entire road right of way that crosses through the middle of the site is within the site boundary as long as you maintain 5 meters clear height in that area for safe passage of vehicular traffic.

59. Q: I cannot open the DWG file as it is in a newer format than I have.

A: We have saved the AutoCAD file back to the 2000 version. This was done on April 8.

60. Q: Is it possible to put entering paths from near building blocks? In other words is it possible to let people enter the site directly from the buildings and adjacent courtyards?

A: Yes, it is encouraged to allow pedestrians to access the site from all sides.

61. Q: Can I include images in my written description to help illustrate the narrative?

A: Yes, you may include images and diagrams within your written description. If you do, please downsize them in the DOC file, and be sure to include high-resolution versions of the same images as separate JPG uploads.

62. Q: Three questions: Where is the Masdar City wastewater treatment plant? What is the volume of water used for irrigation and what is the source of irrigation water? What is the density of development in Abu Dhabi?

A: We recommend that you look at the following public documents:

http://www.masdarcityfreezone.com/masdar261/static/pdf/explore_masdar.pdf
See page 27 for information about the membrane bioreactor. It is located at J-23 on the Land Use Plan (Supplemental Documents) for Masdar City.

Grey water is used for irrigation.

https://www.ecouncil.ae/PublicationsEn/plan-abu-dhabi-full-version-EN.pdf
Section 5 provides information on development density.

63. Q: When your talk about the superficial level water table. How much (in average) we must consideration in design site? And is this variable for seasons?

A: Please find below a few public sources that will provide guidance for the level of design detail (conceptual) that LAGI 2019 design competition is requesting. LAGI does not have access to site/project-specific groundwater survey information.

- **https://en.wikipedia.org/wiki/Sabkha**
- **https://www.academia.edu/7924146/Dewatering_Guidelines_for_the_City_of_Abu_Dhabi**
- **https://link.springer.com/article/10.1007%2Fs100400100137**
- **http://www.dfi2.org/update/AbuDhabiDewateringGuidelines.pdf**
- **https://www.researchgate.net/profile/Samy_Elmahdy2/publication/276410517_Groundwater_of_Abu_Dhabi_Emirate_a_regional_assessment_by_means_of_remote_sensing_and_geographic_information_system/links/55fc0ef708ae07629e08435b.pdf**

64. Q: Can we enter the LAGI 2019 competition on the last day and register to the competition site at the same time and upload our files? Or we should to register earlier?

A: You may register at any time until the submission deadline on May 12 and begin your upload at that same time. By registering today, you will be included in emails when there are updates.

65. Q: Can we use our technology which is still under development? It will be available on the market in 6 months.

A: Yes, you are welcome to use your technology, especially since it will be functioning by the time an artwork would be constructed at this site.

66. Q: Must we calculate the amount of the energy produced by the artwork?

A: Yes, please calculate the amount of energy as best you can, given the conceptual nature of the design at this stage. This is sometimes referred to as a "back of the envelope calculation."

One of the selection criteria listed in the design guidelines is "the estimated amount of clean energy that can be produced by [your artwork]" and your written narrative should include:

- **a 1,200-word maximum written description**
- **technology used in your design**
- **nameplate capacity in kWp (peak output measured in kilowatts of power)**
- **annual kWh (kilowatt-hours) of energy expected to be generated by your design under average site conditions**
- **dimensions, list of the primary materials used in your design, and an order-of-magnitude conceptual cost estimate**
- **a 300-word maximum environmental impact summary (this is in addition to the 1,200-word narrative)**

67. Q: By the competition guideline, we must limit our concept to $20 USD per watt. That symbolic price doesn't depend on the annual capacity, true? Because the annual capacity would be a large number (for example 10000 MW). Do you offer any reference to calculate this fixed price?

A: Yes, the $20 per installed Watt capacity (Wpeak) or nameplate capacity refers to the peak potential power output under ideal conditions for energy production. Annual capacity is measured in kilowatt-hours (kWh) or MWh and is the accumulation of power over time, or energy.
Energy = Power × time.

An example:
You propose a 1 kW wind installation along with 20 kW of solar modules = 21,000 Watts (21 kW) total peak capacity (power). Your artwork has the potential to generate a total of 21 kW under the ideal conditions (the wind is blowing strong on a very sunny day). It is this number that you should use in your cost estimate. Your artwork shouldn't cost more than $420,000 to install ($20 x 21,000 Watts).

A 1 kW wind turbine will cost about $2,000 to install and the solar modules are $60,000 ($3.00 per watt) to install, which leaves $358,000 for other materials and installation. For more inventive energy harvesting technologies, we ask that you make your best guess and provide some background about your reasoning.

Over the course of an entire year, you can estimate the annual capacity (energy) as follows:

Wind: 1 kW x 8,760 hours per year x 30% capacity factor = 2,628 kWh
Solar: 20 kW x 8,760 hours per year x 18% capacity factor = 31,536 kWh

Total = 34,164 kWh (34 MWh) produced over the course of a year by an installation with a 21 kW capacity.

You will need to make an approximation on your capacity factor. For example, solar capacity factor can range greatly depending on the direction the solar panel is facing. Ideal conditions would be about 20%, but if it is sometimes shaded by surrounding buildings that number would be less. Again for more inventive energy harvesting technologies, please use your best judgement on a capacity factor, recognizing that your device will not likely be operating at peak performance all 8,760 hours in a year.

68. Q: About the $20 per watt limit, should the cost of constructing everything that is designed in the site boundary be calculated, or the cost of renewable energy installation only? For example, if an entry has a small building and landscaping, must the cost of constructing the building and planting be calculated in the $20 per watt limit?

A: Please limit your calculation for the $20 per watt to what you consider to be your public artwork that uses renewable energy technology as the media for creative expression. This should include the actual renewable energy installation and any sculptural elements that are integrally connected with it. You may exclude any buildings, auxiliary structures, street furniture, and landscaping, although it is recommended that these elements be considered as a part of your overall composition and design of a cohesive visitor experience.

69. Q: Is it possible to anchor anything to the buildings surrounding the plot?

A: It is preferable that you do not rely on the surrounding buildings as structural support or anchoring for your proposal. However, if you decide to do so because it improves and supports your artistic vision, then you will not be disqualified for doing so, and your proposal will still be judged anonymously and without prejudice on this detail.

Keep in mind that the exact footprints of the surrounding buildings may yet change slightly from what is shown in the most recent master plan. Therefore, the exact points of contact between your artwork and the buildings should be amenable to design alteration in order to accommodate modifications in the building facade details between now and their construction. Any lateral or vertical forces applied to the facades of the surrounding buildings should be quite restricted (a very light touch) so as not to impose undue structural design burdens on the buildings.

END OF Q+A DOCUMENT