

## Environmental Impact Statement for the

# Outline development application for an Offshore Wind farm at Sikka l-Bajda, l/o Mellieħa (PA 01821/09)

**Your Ref:** CT 2509/2009  
**Our Ref:** ENV32980/A/10



**Non-Technical Summary**  
**July 2012**



**ais** environmental ltd.

## 1. Description of the Proposed Development

An Environmental Impact Statement (EIS) is hereby being presented in connection with Planning Application PA 01821/09 in relation to an outline application for a wind farm including laying of power cables between turbines, offshore, Sikka l-Bajda, l/o Mellieha. This is one of three proposed wind farms which are being proposed by the Ministry for Resources and Rural Affairs (MRRA) and is the only one located offshore, the other two being land-based.

The proposed development will have a capacity of 95MW<sup>1</sup> (Megawatts) and is known as Sikka l-Bajda Wind Farm. The turbines will be connected to the national electricity grid through a substation. The site will be made available to a developer who will construct and operate the farm for a period of 20-25 years after which the farm will be decommissioned and the wind turbines and other related systems removed.

The proposed development site is located 1.4km off Rdum il-Madonna at its closest and 2.16km from Fra Ben area at Qawra. The development site covers an area of about 11km<sup>2</sup> with a water depth varying between 10-35m.

The details of the proposed development are found in the Project Description Statement (PDS) issued in April 2009. The development is aimed at providing a significant source of clean, renewable electricity that would make a major contribution towards meeting Malta's renewable energy target of 10% by 2020. The site should provide about 5.5% of the projected electricity consumption in 2020.

## 2. Consideration of Alternatives

Three different options were considered for this project these being labelled A, E and F. Table 1 shows the details of the different layouts, the main differences being in the number of turbines, rotor dimensions and hub heights. The overall height is almost the same in all cases.

Option	Rotor Diameter /m	Hub Height/m	Tip Height/m	Number of turbines
A	126	100	163	19
E	112	105	161	24
F	100	110	160	28

Table 1: Details of Turbine layouts

Alternative foundation types include Gravity type, Monopile, Tripod and Jacket. There are two options of how cables can be installed between turbines, one involves the use of trenching

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<sup>1</sup> The final wind farm size and layout will depend on the outcome of detailed technical and environmental studies.

equipment and the burying of the cable at a certain depth below the surface. The second option involves the laying of the cable on the seabed. The different options of foundations used and cable laying have their own limitations and produce a number of impacts which have been assessed.

### **3. Planning, Policies and Legislation**

The development plans for the area within which the site is situated are a primary consideration against which the planning application would be determined. The North West Local Plan is the one which is affected by this development.

The other main legislative provisions which are relevant to the proposed development are (i) Maltese main legislation: Acts of Parliament; (ii) Maltese subsidiary legislation: Legal notices including those which transpose EU Directives into Maltese law; and (iii) EU Commission Communications.

### **4. Land Use and Sea Use**

Since the proposed development will be situated offshore, impacts are highly localised to sea uses rather than land uses during the various phases of the development. The potential impacts on present sea uses are expected to be caused by loss of sea space, access restrictions and redirection of certain sea uses.

Significant negative impacts have been identified by the introduction of access restrictions and changes in navigation routes especially on daily cruises, sailing boats and other vessels. Other impacts include loss of sea space for bunkering operations and aquaculture during all phases of the development.

The proposed development is not anticipated to have any further impact on the surrounding land uses.

### **5. Marine ecology**

The methodologies adopted for the seafloor assessment included the deployment by divers and a remotely operated underwater vehicle towed along a series of transects spanning over the entire survey area. Results from a side-scan survey were also consulted to characterise the benthic topography and geology of the surveyed area.

Different marine habitats were identified for the marine area surveyed, with hard bottoms being dominated by Neptune grass which formed a variety of different conformations and

which, in many cases, was associated with a variety of green and brown algal species. Bare sand patches were mainly dominated by coarse sand which in turn was also covered with accumulations of maerl fragments or of seagrass debris. There was also evidence of extensive human disturbance on the seabed, which is not too surprising considering that the area is extensively used for bunkering purposes.

Anticipated impacts arising from the proposed development were divided into three types – those for the construction, operational and decommissioning phases. Disturbance to bottom living communities, reduction in the water transparency and noise are expected in the areas directly affected by construction activities. Cetacean species, such as dolphins and whales, and fish species are especially affected by the noise generating activities. Servicing vessels operating during this phase are also expected to lead to some negative impacts, as through anchoring and release of fuel-linked residues in the water. During the operation of the installed turbines, anticipated impacts are expected to be on a lower scale than during the construction phase and these include a possible change in the water currents around the turbines, the release of toxic paint residues used to minimise fouling on the turbines and an increased risk of collision with vessels (which in turn would lead to other impacts, such as an oil spill). It is expected that the installed turbines will be decommissioned after 20-25 years and their removal is also expected to generate negative impacts, most of which are similar to those expected for the construction phase. The magnitude of such impacts depends on how much the life on the seabed would have recovered since the construction of the wind turbine foundations. The stoppage of current operations on site, such as bunkering and fish farming could lead to positive impacts in the form of greater fish populations in the area.

In order to minimise the negative environmental impacts as much as possible, it is recommended that a particular type of turbine foundation – the gravity one – be avoided in view of the large bottom area it extends over. In addition, bubble screens and silt curtains should be used throughout the construction phase to prevent the dissipation of submarine noise and turbid water, and buoys should be put in place so that servicing vessels don't need to continuously drop anchor (anchoring causes negative impacts on benthic habitats). Some negative impacts are still anticipated, mainly as a result of the positioning of the turbine foundations on the seabed, in spite of all the precautionary measures undertaken.

## **6. Quality of the Marine Environment**

The assessment on the quality of the marine environment showed that only local and minor changes are anticipated in connection with the currents, sediments and wave conditions during the operational phase. These will occur in the immediate vicinity of the individual turbine foundations. For these reasons, no marked influence is expected on the water quality.

Increased localised copper contamination may be expected during the operational phase, as a result of the total annual discharge of the unspecified amount of copper from the slip-rings in the wind turbines.

The wind turbines will have to be periodically de-rusted, perhaps being sandblasted and painted at least once during their lifetime, as part of the routine maintenance. The sandblasting and painting will lead to a temporary spill of paint, paint waste and sand. The impacts on water quality by the sandblasting and paint are unknown due to the unspecified frequency of repainting as well as to the chemical composition of the sand and paint. It is recommended that factors such as the toxicity of the paint be investigated, and that spills and the impact of waste be reduced as much as possible.

The water quality in the wind farm area and along the cable line's passage to shore will only be affected in a minor way during the construction phase. The impacts will result from seawater sediment spillage and resettling, caused by the construction of the wind-turbine foundations and as a result of water jetting of the cable into the sediment.

During the construction phase, works and construction personnel may have to spend some time off-shore. Facilities for sewage should therefore be made available to impede the discharge of sewage and other generated wastes into the sea.

On the basis of the expected impact from the establishment of the wind farm, it is not deemed necessary to carry out special programmes during the construction phase for monitoring of the water quality.

A monitoring and control programme is recommended during the operational phase in order to follow the impact of increased copper concentration on the pelagic primary production and the qualitative and quantitative composition of microflora. The alternative is to initiate recovery or elimination of the copper-laden waste.

## **7. Avifauna**

The avian assessment was undertaken to identify the effects on avian species in the development area and its surroundings. The methodology undertaken included a yearlong field survey from a number of viewpoints in the surroundings together with a four year long historical data set from other viewpoints in the vicinity, thus obtaining an extensive understanding of the avian species normally found in the area. This was supplemented with collated data from the LIFE Yelkouan Shearwater Project which has just been concluded.

A number of sensitive migrating and resident species were identified and assessed according to established criteria. These species were classified as sensitive due to the fact that they have been classified as species of environmental concern. These include SPEC 1, SPEC 2 and SPEC 3 species, Birds Directive Annex I species and European Threatened Species.

The main concerns resulting from the project are:

- the impact on shearwaters (Cory's and Yelkouan) by locating the development in a known core rafting area in front of their breeding colonies; Whereas the Cory's shearwater is considered as a SPEC 2 species, vulnerable under the European Threatened Species category and an Annex I species under the Birds Directive, the Yelkouan shearwater is an Annex I species. Both are listed species for the Rđum il-Madonna SPA, hence they are of utmost priority to the conservation of the site.
- the level of impact of the development on nocturnal migrants which utilize the area as their migrating route.

Overall, the perceived effects of the development on the avian species are considered as significant.

A number of mitigation measures have also been suggested as a means to attenuate or remove the envisaged impacts, however, the success levels of such measures remains doubtful and might render the whole project not economically feasible. Most of the mitigation measures suggested have never been tested elsewhere and so their level of success remains unknown.

## **8. Bats**

To inform this assessment bat surveys were undertaken over an extended period in order to gauge bat usage of the Rđum tal-Madonna, the Ġhadira Nature Reserve and at Selmun. Remote frequency division bat detectors were used to continuously record bat activity over a year period at fixed locations within the three sites.

The study sites are confirmed to be used by foraging Maghrebian mouse-eared bats, grey long-eared bats, common, soprano, Kuhl's and Savi's pipistrelle and common noctule. It was considered that common bent-wing may also occur in Malta despite being assumed as extinct since the 1960s.

Pipistrelle species were found to occur at relatively high activity levels throughout the year at Ġhadira with lower activity levels of Maghrebian mouse-eared bat and grey long-eared bat also found throughout the year. Bat activity at Rđum tal-Madonna consisted of a similar suite of species but at lower levels of activity. In addition common noctule was infrequently recorded at Rđum tal-Madonna. Bat activity at Selmun was found to be intermediate when compared to the other two sites.

The potential impacts on bats due to the proposed Sikka l-Badja wind farm include; collision with turbines causing physical injury; barotrauma and the presence of the wind farm acting as a barrier to the migratory movements of bats.

Although some seasonal differences were recorded for the bat species found, it was considered that these were most likely due to differences attributed to lifecycle changes and short-distance movements between summer and winter roosts. It was considered highly unlikely that bats would migrate over or near to the proposed offshore windfarm location although there was a low possibility that low numbers of common bent-wing and common noctule may occur within the vicinity. The possibility of bats foraging within the proposed windfarm location was considered to be negligible.

The impact significance on the conservation status of all bat species recorded was found to be not significant in terms of the EIA. It was further considered that the proposed scheme is unlikely to result in an offence being committed under the national regulations.

## **9. Sea/Landscape Character and Visual Amenity**

The aim of this report was to establish the impact of the proposed development would have on the existing landscape and on the visual amenity of the site.

The report was split up into two parts, that is, the Landscape Assessment and the Visual Assessment. The report consisted of a literature review and field surveys, including photographic surveys and a questionnaire.

Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape.

Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the change arising and to the overall effects with respect to visual amenity.

A Zone of Theoretical Visual Influence (ZTVI) was carried out at three heights, namely, at 6m, 81.5m and 163m, as requested by the Malta Environment and Planning Authority (MEPA) and extended over an area of 25Km away from the sight. This distance was selected to represent the furthestmost point of the Island from the proposed development site. Sixteen viewpoints were agreed with the MEPA to be used for the Visual Impact Assessment representing short, medium and long distance views from the application site.

The Landscape Value assessment showed that the landscape value from almost all the selected viewpoints will be negatively affected, in some case more than in others. It has been demonstrated that in areas where natural elements and characteristics are predominant, the effect is much more pronounced. This is mainly due to the fact that people seek these areas and associate them with their respective tranquility and serene environment and the contact with nature and natural elements found here is something which is usually unique to these peculiar places. It was also shown that in places which had a similar view of the development but different existing surrounding landscape characteristics, the effect of the development was much less pronounced than in the former case (e.g. Qala compared with Qawra).

The results from the questionnaires raised a number of concerns from various people, mainly that the turbines are an eyesore or ugly, they look too clustered together and that they are too close to the shore, some even questioning the safety issue as well. Some people also qualified their response by saying that they are a necessary evil in spite of being an eyesore. Others were more critical in their responses by stating that there were other sources of energy which could be harnessed. Others, mainly from responses from the Pembroke area thought that they would liven up an otherwise dull landscape.

The Landscape Assessment showed that the proposed development would have a severe adverse to a minor adverse impact on the existing landscape, much depending of the visibility and proximity of the development to the proposed turbines and the type of existing landscape. The nature and size of the development impose limits as to the type of mitigation measures which could be undertaken mainly due to existing international and local safety regulations in this sector and others which have a direct bearing on it.

The area under consideration is not considered as an Area of High Landscape Value. The Visual Assessment showed that the development has a significant impact from almost all chosen viewpoints in spite of the fact that the views from all the points varies significantly. The development doesn't allow much in terms of mitigation measures mainly due to the size of the structures and also the international standards and regulations controlling such a development, hence the only potential measure which could be applied but which would not serve much as a mitigation measure is that of the choice of colour for the structures. This would only render the structures less conspicuous than if flashy colours are selected.

## **10. Geology, Geomorphology and Palaeontology**

The area of development is a submerged terrestrial landscape, the morphology of which has been shaped by subaerial geological processes acting when the landscape was above sea level. Sikka l-Bajda consists of an elevated, Upper Coralline Limestone plateau that has irregular seabed morphology, which is characteristic of a karstified limestone pavement. This pavement is characterised by four solution subsidence structures, which range from 60 m to 270 m in



diameter and represent an advanced stage of solution weathering. The boundaries of Sikka l-Bajda reef are characterised by steep escarpments coinciding with normal faults, marine terraces developed by lower sea levels and slope instability in the form of spreading. The seabed around Sikka l-Bajda reef predominantly comprises gently sloping sediment beds.

The major negative impacts associated with the proposed development include the destabilisation of the solution subsidence structures and, potentially, the obliteration/destabilisation of the submerged karstified plateau. Minor negative impacts include the production of waste material, the destabilisation of the cliff face at the edge of Sikka l-Bajda reef and sediment contamination. Insignificant negative impacts include loss of mineral resource, disturbance to sediment, and sediment erosion. Proposed measures to mitigate these impacts include: (i) relocation of wind turbine sites, (ii) adequate choice of turbine foundations, (iii) formulation and implementation of a construction management plan, (iv) carrying out detailed geophysical and geotechnical studies of the AoI, (v) placing waste in licensed inert landfills or recycle it as aggregate, (vi) carrying out installation and decommissioning of wind turbines in good weather conditions, (vii) protect base of turbines with rock aggregate, boulders, grout-filled bags, concrete mattresses or anchored polypropylene fronds, and (viii) lay submarine cables on seabed.

A major positive impact is the protection of the seabed during the operation of the proposed development.

## **11. Noise**

The proposed wind farm lies from 1 to 3km out at sea. The closest sensitive receptors are located on land in rural and urban areas. The ambient environmental sounds in the sensitive receptors consisted mainly of bird and insect sounds, local and distant traffic, and tree / grass sounds which varied depending on the wind speed.

The assessment has concluded that baseline noise levels were above the World Health Organisation guidelines for community noise (50 dB A during the day and 45 dB A during the night) in all sensitive receptors.

The predicted noise levels will not reach the chosen day-time 75 dB A (for dwellings) during construction activities in all sensitive receptors, however, there will be increase in the background noise levels during construction works as follows:

- Buġibba – slight impact
- Selmun – moderate impact
- L-Aħrax tal-Mellieħa – slight impact
- Comino – Substantial impact

A slight impact will be evident during the operational phase at all sensitive receptors (resulting from an increase of between 0.1 and 2.9 dB in the background noise levels). A moderate impact is possible at L-Ahrax tal-Mellieha during the night (resulting from an increase of between 3.0 and 4.9 dB in the background noise levels).

The noise prediction calculations have been made while taking into consideration the worst case scenario with regards to development of the site, location of the area and utilisation.

Throughout the assessment, it has been assumed that the ambient environmental noise at each location will vary depending on the activities occurring in the location while the works are taking place. In areas where there is a relatively constant noise level (e.g. near a road where there is constant traffic passing), the noise level will remain constant due to the steady noise input from the traffic. In other areas where the noise level is not constant (e.g. areas which are frequented by people), the noise level will depend on the amount of people visiting the site at a particular time.

With regard to underwater noise, pile-driving, dredging and rock laying works can result in both physical and behavioural impacts on the marine sea life, whilst, operational noise would cause a behavioural change in a particular species, as a result of the low frequency noise.

The vibration impacts will be imperceptible to people and will have no effect on buildings in the targeted sensitive receptors.

## **12. Archaeological Sites and Cultural/Historical Features**

Given the possibility that there might be archaeological remains in the area of development at Sikka l-Bajda, an assessment of the archaeological and cultural heritage potential of the area was carried out.

No historical documentary evidence was found for the presence of archaeological remains in the area of influence. Since the area was mostly unexplored in the past, a remote sensing survey of the seabed to identify and map possible archaeological artefacts or deposits was conducted. To this aim, a side scan sonar exercise was conducted in the area of development. This generated a high-resolution mosaic covering the entire survey area and a target report highlighting various habitats in the area.

The results of the side scan sonar survey showed that there are no visible archaeological remains. However, most of the area was found to be densely covered in seagrass meadows which can be covering features beneath it and may cover some archaeological sites and/or objects. Areas with seagrass colonies usually have a higher probability of yielding ancient artifacts since the seabed would be pristine.

Given the results of the research and side scan sonar survey there will be no evident impact on submarine archaeological remains. However, given the nature of the seabed it is being suggested that once the exact positions of the turbines, of the offshore wind mast and offshore transformer platform are decided, the sediments should be surveyed using a sub bottom profiler to ensure that no archaeological sites are buried in those locations; and that all dredging and/or excavation works conducted on the site should nevertheless be monitored by a qualified archaeologist under the direction of the Superintendence of Cultural Heritage.

### **13. Impacts on Human Populations**

The Sikka l-Bajda wind farm proposal in the North-eastern part of Malta is located within the seascape of the residential and touristic resorts areas of Għadira and St. Paul's Bay and the localities of Mellieħa, Buġibba, Qawra, Għajnsielem and Qala. These areas and their coastal development are mainly frequented by local and foreign tourists as well as the presence of large cluster of boat houses, caravan and picnic areas, bungalows, hotels, bars and restaurants, kiosks, illegal beach rooms and residential units.

Analysis of the surveys indicated that residents and visitors alike have this perceived notion that very little direct positive qualities may result from wind farm development. In fact, during the distribution of the questionnaire, a large number of respondents did not collaborate in answering the survey. Such behaviour may possibly be due to either limited information provided to the general public or due to lack of trust in public authorities with regards to national projects and in the scientific studies associated with the said development. Some of these issues could be overcome by increased awareness and more communication with the stakeholders concerned.

The proposed development is envisaged to generate both adverse and beneficial impacts on the human populations during its various stages. The concept achieved from the public surveys and stakeholders interviewed was a negative one in general – impacts mentioned included visual and noise and loss of open space for sea users. Negative impacts to marine habitats and birds were a concern to various entities, especially NGOs with special interest in the natural environment. The overriding positive impact identified by those surveyed was the creation of jobs. Although those interviewed have the perception that there will be an element of shadow flicker, studies have showed that this will not be the case.

### **14. Secondary and Cumulative Effects**

A number of secondary impacts would be generated during all phases of the project. These are mainly positive economic spin offs from the project, as a result of lodging requirements, servicing, temporary and permanent employment, consultancy services etc.

There is also a potential for the reuse of any extracted material from the area to be used on land thus resulting in an extension for the availability of land resource for aggregate material, i.e. a positive impact. However, if such material is dumped at sea, this would have a negative impact on the surrounding benthic environment and water column.

The different phases of development could also have an impact on the sale of fuel for vessels taking a longer journey and also on the generation of pollutants as a result of a greater combustion of fuels.

Secondary impacts are envisaged on the holding company of the fish farm in the vicinity due to additional costs incurred in reaching the new site. The existing benthic environment of the farm is bound to improve in due course whereas, the benthic environment at the new site is bound to have an opposite effect.

The decommissioning part would have similar impacts as the commissioning one, albeit it could generate income for waste brokerage companies who would buy the material for recycling purposes and so also generate an additional economic effect not witnessed at the commissioning stage.

The cumulative effects which could take place as a result of this development concern mainly the visual and landscape and the ecological aspect. Additional turbines within the field of viewpoint of this development and/or enlargement of this development could lead to cumulative effects at the time when these would materialise.

The disturbance of the aquatic species in terms of fish and availability of food would in turn have a direct impact on the avian species which currently use the area for feeding and rafting purposes. This impact could also have another impact of the breeding species which currently use this site for such purposes, hence this could affect the success of the latter species. Such an impact would be apart from the potential effects the turbines could have on such receptors.

The identification of any archaeological remains during any of the phases of the development and the potential retrieval of such remains or excavation of the site could have an additional impact on benthic communities which are found in the area and which would already have been impacted by the presence of construction/ decommissioning vessels and/or by the installed

turbine structures. Any interventions on the sea bottom which could have an additional impact on the benthic communities over and above those already foreseen with respect to the proposed development should not be undertaken unless a proper prior assessment is undertaken.

**Dikjarazzjoni dwar l-Impatt Ambjentali għall-**

**Applikazzjoni tal-iżvilupp ta' *Wind farm*  
fuq is-Sikka il-Bajda, limiti tal-Mellieħa  
(PA 01821/09)**

**Your Ref: CT 2509/2009  
Our Ref: ENV32980/A/10**



**Sunt Mhux Tekniku  
Lulju 2011**



**ais** environmental ltd.

## 1. Deskrizzjoni tal-Iżvilupp li qed jiġi propost

Dikjarazzjoni tal-Impatt Ambjentali (EIS) qed tiġi mressqa b'rabta mal-Applikazzjoni tal-Ippjanar PA 01821/09, b'konnessjoni mal-applikazzjoni għal *wind farm* inkluż it-tqegħid tal-*power cables* bejn it-turbini, l-barra mix-xatt fis-Sikka l-Bajda, fil-limiti tal-Mellieħa. Dan huwa wieħed minn tliet *wind farms* li qed jiġu proposti mill-Ministeru għar-Riżorsi u l-Affarjiet Rurali (MRRA) u hu l-uniku wieħed li jinsab 'il barra mix-xatt hekk kif it-tnejn l-oħra huma proposti għal fuq l-art.

L-iżvilupp propost se jkollu kapaċità ta' 95MW<sup>2</sup> (Megawatts) u jkun magħruf bħala l-*Wind Farm* tas-Sikka l-Bajda. It-turbini se jkunu mqabbda mal-grid tal-elettriku nazzjonali minn *substation*. Is-sit se jingħata lil iżviluppatur li jibni u jopera l-*wind farm* għal perjodu ta' bejn 20-25 sena. Wara dan, il-*wind farm* jingħalaq u t-turbini tar-riħ flimkien ma' sistemi oħra konnessi miegħu jitneħħew.

Is-sit għall-iżvilupp propost jinsab 1.4km 'l bogħod minn Irdum il-Madonna fl-iktar punt qarib tiegħu u 2.16km 'l bogħod minn Ta' Fra Ben fil-Qawra. Iż-żona ta' iżvilupp tikkonsisti f'madwar 11km<sup>2</sup>, bil-fond tal-ilma jvarja bejn 10-35m.

Id-dettalji tal-iżvilupp propost jinstabu fid-Dikjarazzjoni tad-Deskrizzjoni tal-Proġett (PDS) ippubblikata f'April 2009. L-iżvilupp jimmira li joffri sors ta' enerġija nadifa u rinnovabbli u li tikkontribwixxi biex sal-2020 Malta tilhaq il-mira li 10% tal-enerġija rinnovabbli. Is-sit mistenni jipprovdi 5.5% mill-konsum totali tal-enerġija tal-2020.

## 2. Konsiderazzjoni tal-Alternattivi

Tliet għażliet differenti ġew ikkunsidrati għal dan il-proġett u ġew msejha A, E u F. It-Tabella 1 turi d-dettalji ta' kif jistgħu jiġu mqassma. Id-differenzi prinċipali huma n-numru ta' turbini, id-daqs tar-rotor u l-għoli tal-*hubs*. Bejn wieħed u ieħor, huma kollha għoljin indaqs.

Għażla	Diametru tar-Rotor /m	Għoli tal- <i>hub</i> /m	Għoli tal-ponta/m	Numru ta' turbini
A	126	100	163	19
E	112	105	161	24
F	100	110	160	28

Tabella 2: Dettalji ta' kif jitqassmu t-turbini

<sup>2</sup> Id-daqs aħħari tal-*wind farm* u kif ikun imqassam se jiddependi fuq ir-riżultat ta' studji dettaljati fuq livelli tekniċi u ambjentali.

Alternattivi oħra għall-pedamenti jinkludu t-tip *Gravity, Monopile, Tripod* u *Jacket*. Hemm żewġ modi kif jistgħu jitqiegħdu l-*cables* bejn it-turbini. L-ewwel wieħed jinvolvi t-tħaffir u li l-*cable* jindifen f'ċertu fond taħt qiegħ il-baħar. It-tieni għazla hi li l-*cables* jitpoġġew ma' qiegħ il-baħar. Il-pedamenti differenti għandhom il-limitazzjonijiet tagħhom u jkollhom xi impatti li ġew evalwati.

### **3. Ippjanar, Politika u Legislazzjoni**

L-applikazzjoni għall-ippjanar tiġi kkunsidrata skont iż-żona li s-sit għall-iżvilupp jinsab fiha. Fost il-pjanijiet affetwati mill-iżvilupp, hemm il-Pjan Lokali għall-Majjistral ta' Malta.

Id-dispożizzjonijiet legislattivi prinċipali l-oħra li huma rilevanti għall-iżvilupp propost huma (i) Il-legislazzjoni prinċipali ta' Malta : L-Atti tal-Parlament; (ii) Legislazzjoni Maltija sussidjarja : Avviżi legali inklużi dawk li jisiltu Direttivi Ewropej fil-liġi Maltija; u (iii) Komunikati mill-Kummissjoni Ewropea.

### **4. Użu tal-Art u Użu tal-Baħar**

Minhabba li l-iżvilupp propost se jkun 'il barra mix-xatt, l-impatti se jikkonċernaw iktar l-użu tal-baħar milli dak tal-art u dan tul fażijiet varji tal-iżvilupp. L-impatti potenzjali fuq l-użi tal-baħar attwali mistennija jkunu telf ta' spazju, restrizzjonijiet għall-aċċess u ridirezzjoni ta' xi użi tal-baħar.

Ġew identifikati numru ta' impatti negattivi mill-introduzzjoni ta' restrizzjonijiet għall-aċċess u bidliet fir-rotot ta' navigazzjoni, speċjalment għal *cruises* li jsiru ta' kuljum, dgħajjes tat-tbaħħir u bastimenti oħra. Impatti oħra jinkludu t-telf ta' spazju mill-baħar għal xogħolijiet ta' bastimenti u akwakultura, u dan japplika għall-fażijiet kollha tal-iżvilupp.

L-iżvilupp li qed jiġi propost mhux mistenni li jkollu xi effetti oħra fuq l-użi attwali tal-art tal-madwar.

### **5. Ekoloġija marittima**

Bħala parti mill-metodoloġija għall-evalwazzjoni tal-qiegħ tal-baħar, għaddasa u apparat-vettura għal taħt il-baħar li tithaddem mill-bogħod ntużaw biex evalwaw kampjuni tal-art u b'hekk giet evalwata ż-żona kollha. Ir-riżultati minn stħarriġ ta' *side-scan sonar* intużaw sabiex tiġi stabbilita t-topografija betnika u l-ġeoloġija taż-żona infisha.



Ġew identifikati numru ta' abitati marittimi differenti fiż-żona li giet evalwata, b'qiegħin iebša bi preżenza qawwija ta' Posidonja f'konformazzjonijiet differenti u li f'ħafna każijiet, assoċjata ma' speċi ta' alka ħodor u kannella. Rqajja ta' ramel huma ffurmati minn ramel oħxon li xi drabi jkun fih xi frammenti ta' *maerl* u biċċiet ta' Posidonja. Instabet ukoll evidenza li l-qiegħ tal-baħar huwa estensivament ddisturbat minn attivitajiet umani. Dan mhux fatt sorprendenti għaliex iż-żona tintuża spiss minn bastimenti għal *bunkering*.

L-impatti mistennija mill-iżvilup propost tqassmu fi tliet kategoriji – dawk relatati mal-fażijiet tal-kostruzzjoni, tal-operat u tal-faži tat-tneħħija. Fiż-żoni direttament affettwati minn attivitajiet ta' kostruzzjoni huwa mistenni li l-abitati ta' qiegħ il-baħar jiġu mgarrfa jew ddisturbati minn nuqqas fit-transparenza tal-ilma u żieda ta' storbju. Speċi ċetaċji, bħal dniefel u baleni, u xi ħut jistaw b'mod partikolari jiġu affettwati minn dan l-istorbju. Ix-xogħolijiet ta' waqt din il-faži ukoll mistennija jhallu xi impatti negattivi minħabba ankrar tal-bastimenti u r-rilaxx ta' residwi tal-karburant fl-ilma. Waqt l-installazzjoni tat-turbini, huwa mistenni li l-impatti jkunu iżgħar minn dawk tal-faži tal-kostruzzjoni u jkunu possibilment jikkonsistu f'bidliet fil-kurrenti tal-ilma madwar it-turbini, ir-rilaxx ta' residwi tossiċi taż-żebgħa li tintuża sabiex tonqos il-possibiltà ta' ħsara lit-turbini u żieda fir-riskju li jkun hemm ħabta ma' xi bastiment ieħor (b'dan iwassal għal impatti oħra, bħal per eżempju t-tixrid taż-żejt). Huwa mistenni li t-turbini jieqfu joperaw 20-25 sena wara li jiġu installati u t-tneħħija tagħhom mistennija toħloq impatti negattivi ukoll, bil-biċċa l-kbira minnhom huma simili għal dawk mistennija fil-faži tal-kostruzzjoni. Id-daqs ta' dawn l-impatti jiddependi fuq kemm il-ħajja fil-qiegħ tal-baħar tkun irkuprat wara l-bini tal-pedamenti tat-turbini tar-riħ. Apparti l-impatti negattivi, jekk il-proposta tal-*wind farm* twassal biex jieqfu attivitajiet ta' *bunkering* u akwakultura, u jekk fiż-żona tal-*wind farm* ma jkunx permess li jsir sajd (sabiex ma ssirx ħsara lill-*cables* per eżempju), huwa mistenni li jkun hemm impatti pożittivi, bħal tkabbir fil-popolazzjonijiet tal-ħut.

Sabiex kemm jista' jkun titnaqqas il-possibiltà ta' impatti negattivi fuq l-ambjent marittimu, qed jiġi rrakkomandat li tip partikolari ta' pedamenti tat-turbini – dik Gravity – tiġi evitata minħabba l-qiegħ kbir tagħha u l-ammont konsiderevoli ta' spazju li tiegħu. Apparti minn hekk, *bubble screens* u *silt curtains* għandhom jintużaw waqt il-faži ta' kostruzzjoni sabiex jiġi evitat it-tixrid ta' storbju u ilma mdardar. Għandhom ukoll jitpogġew bagi sabiex bastimenti ta' manutenzjoni ma jkollhomx għalfejn jankraw il-ħin kollu (l-ankrar iwassal għal impatti negattivi). Minkejja li jittieħdu miżuri ta' prekawzjoni, huwa antiċipat li xorta jkun hemm xi impatti negattivi minħabba l-istallar tal-pedamenti tat-turbini f'qiegħ il-baħar.

## 6. Kwalità tal-Ambjent Marittimu

L-evalwazzjoni tal-kwalità tal-ambjent marittimu wriet li se jkun hemm biss bidliet żgħar lokali relatati mal-kurrenti, mas-sedimenti u mal-kundizzjonijiet tal-mewġ waqt il-faži operazzjonali tat-turbini. Dan kollu se jseħħ fil-vicinità immedjata tal-pedamenti tat-turbini individwali. Għalhekk, mhux mistennija li tiġi affettwata l-kwalità tal-ilma.

Waqt il-faži operazzjonali mistennija jkun hemm żieda lokalizzata fil-kontaminazzjoni tar-ramm. Dan se jseħħ minħabba rilaxx totali annwali ta' ammont mhux determinat ta' ramm minn *slip-rings* fit-turbini.

It-turbini tar-riħ se jkollhom ukoll jitnaddfu mis-sadid kull ċertu ammont ta' żmien, u forsi jiġu *sand blasted* u jingħataw iż-żebgħa għall-inqas darba kemm idumu joperaw, b'dan isir bħala parti mill-manutenzjoni regolari tagħhom. Is-*sand blasting* u ż-żebgħa se jwasslu għal tnixxija temporanja ta' żebgħa, skart relatat ma' żebgħa u ramel. L-impatti fuq il-kwalità tal-ilma minn dan kollu mhux magħruf minħabba li kemm-il darba se jinżebgħu u l-kompożizzjoni kimika tar-ramel u ż-żebgħa għadhom mhux magħrufa. Huwa rrakkomandat li għandhom jiġu stabbiliti fatturi bħat-tossicità taż-żebgħa u li jitnaqqsu t-tixrid taż-żebgħa u l-impatt tal-iskart kemm jista' jkun.

Il-kwalità tal-ilma fiż-żona tal-*wind farm* u madwar il-*cables* lejn ix-xatt se tiġi affettwata mill-inqas waqt il-faži ta' kostruzzjoni. L-impatti se jkunu jinvolvu t-tixrid ta' sediment minħabba l-kostruzzjoni tal-pedamenti tat-turbini tar-riħ u minħabba li jintuża l-ilma bil-prensa għat-tqegħid tal-*cable*.

Waqt il-faži ta' kostruzzjoni, haddiema jista' jkun li jkollhom iqattgħu xi hin 'il barra mix-xtut. Għalekk se jkun hemm bżonn ta' facilitajiet tad-drenagg sabiex ma jkunx hemm tixrid ta' drenagg fil-baħar jew ta' skart ieħor li jinħoloq.

Minħabba l-impatt baxx mistenni mill-*wind farm* mhux meqjus neċessarju li jkun hemm programmi ta' moniteragg tal-kwalità tal-ilma waqt il-faži ta' kostruzzjoni.

Programm ta' moniteragg u kontroll huwa rrakkomandat waqt il-faži operazzjonali sabiex jinżamm kont tal-impatt ta' koncentrazzjoni ta' ramm fuq il-produzzjoni primarja fl-ilma u l-kompożizzjoni kwalitattiva u kwantitativa tal-mikroflora. L-alternattiva hi li l-iskart li jkun fih xi ramm jiġi rkuprat jew eliminat.

## **7. Avifawna**

Saret evalwazzjoni avjarja sabiex jinstabu l-effetti fuq speċi ta' għasafar fiż-żona tal-iżvilupp u l-madwar. Il-metodoloġija li ntużat kienet tinkludi sħarriġ ta' sena li sar fuq is-sit min-numru ta' postijiet fil-madwar, kif ukoll sett ta' data minn punti oħra fil-vicinità li jkopri erba' snin. Għaldaqstant ksibna għarfien estensiv fuq l-ispeċi tal-għasafar li normalment jgħixu f'din iż-żona. Dan kollu ngabar flimkien ma' data li ngabret mil-LIFE Yelkouan Shearwater Project li ntemm reċentament.

Ġew identifikati u evalwati numru ta' speċi sensitivi tal-passa, kif ukoll speċi residenti skont kriterji stabbiliti. Dawn l-ispeċi ġew ikklassifikati bħala sensitivi minħabba raġunijiet ta' konsewazzjoni. L-ispeċi jinkludu speċi SPEC 1, SPEC 2 u SPEC 3, speċi mnizzla fl-Anness I tad-Direttiva tal-Għasafar u l-Ispeċi Ewropej Mhedda.

It-tħassib prinċipali tal-proġett huma:

- L-impatt fuq iċ-ċief u l-garniji minħabba li l-iżvilupp se jsir f'żoni qrib kolonji fejn jitgħammru. Filwaqt li iċ-ċiefa hija speċi ta' SPEC 2 u vulnerabbli skont il-kategorija ta' Speċi Ewropej Mhedda u speċi fl-Anness 1 tad-Direttiva tal-Għasafar, il-garnija hija speċi mnizzla fl-Anness I tal-istess direttiva msemmija. Iż-żewġ speċi huma speċi magħzula għaż-żona mharsa fil-viċin magħrufa bħala Rdum il-Madonna Żona ta' Protezzjoni Speċjali (SPA), u għalhekk huma ta' importanza kbira għall-konservazzjoni tas-sit.
- Il-livell tal-impatt li se jhalli l-iżvilupp fuq speċi li jpassu bil-lejl u li jużaw iż-żona bħala rotta prinċipali.

Ġeneralment, l-effetti tal-iżvilupp fuq speċi avjarji huwa meqjus li se jkun sinnifikanti.

Qed jiġu ssuġġeriti numru ta' miżuri ta' mitigazzjoni sabiex jittaffew jew jiġu eliminati l-impatti mbassra. Madankollu s-suċċess li jista' jkollhom dawn il-miżuri huwa dubjuż u jista' jwassal biex il-proġett ma jkunx ekonomikament vijabbli. Il-maġġoranza tal-miżuri ta' mitigazzjoni li ġew issuġġeriti qatt ma ġew ippruvati f'postijiet oħra u għalhekk mhux magħruf kemm jistgħu jaħdmu.

## **8. Friefet il-lejl**

Saru evalwazzjonijiet tal-friefet il-lejl fuq perjodu estiż sabiex tiġi stabbilita l-attività tal-friefet il-lejl fl-inħawi madwar iż-żona tal-iżvilupp fl-Irdum tal-Madonna, fir-Riserva Naturali tal-Għadira u f' ta' Selmun. Intuża apparat elettroniku li jagħraf il-preżenza tal-friefet il-lejl permezz tal-frekwenzi mill-bogħod. Dan intuża sabiex tiġi stabbilita l-attività tal-friefet il-lejl tul perjodu ta' sena fuq postijiet fissi fit-tliet siti msemmieha.

Is-siti eżaminati kollha ġew ikkonfermati li jintużaw mill-friefet il-lejl, bħall- farfett il-lejl widnet il-ġurdien, il-farfett il-lejl widnejh kbar, il-pipistrell komuni, il-pipistrelle sopran, il-pipistrell ta' Kuhl, il-pipistrell ta' Savi u n-nottola komuni. Ġie kkunsidrat li jista' jkun li hawn il-minjotteru f'Malta, minkejja li dan ilu kkunsidrat estint sa mis-snin 60.

Instab li l-ispeċi tal-pipistrelli kienu attivi ħafna matul is-sena fl-Għadira iżda l- farfett il-lejl widnet il-ġurdien u l- il-farfett il-lejl widnejh kbar kienu inqas attivi mill-ohrajn. Xi haġa simili

nstabet fl-Irdum tal-Madonna iżda l-friefet il-lejl hawnhekk kienu inqas attivi. Apparti minn hekk, instab li n-nottola komuni xi kultant dehret fl-Irdum tal-Madaonna. Meta mqabbel maż-żewġ siti l-oħra, il-preżenza tal-friefet il-lejl f'Selmun kienet ta' livell medju.

L-effetti li l-*wind farm* tas-Sikka l-Bajda fuq il-friefet il-lejl jistaw potenzjalment ikunu dovuti mall-ħbit mat-turbini li jwassal biex il-friefet il-lejl jindarbu u/jew isofru minn barotrawma u minħabba li l-*wind farm* ikun ta' ostaklu għall-friefet il-lejl meta dawn ipassu minn post għal ieħor.

Għalkemm ġew innutati xi differenzi bejn l-istaġuni għall-ispeċi tal-friefet il-lejl, huwa meqjus li dawn kienu l-iktar dovuti għal bidliet fl-istil ta' ħajja tagħhom u minħabba l-vjaġġi qosra li jagħmlu bejn is-Sajf u x-Xitwa. Huwa improbabbli li l-friefet il-lejl jemigraw lejn jew viċin tal-*wind farm* għalkemm hemm possibiltà baxxa li numri żgħar ta' minjotteri u nottoli komuni jsibu ruħhom f'din iż-żona. Il-possibiltà li jkun hemm friefet il-lejl li jfittxu l-ikel fil-post fejn jinsab il-*wind farm* hija kkunsidrata negligibbli.

L-impatt fuq l-istat ta' konservazzjoni tal-ispeċi kollha tal-friefet il-lejl irrekordjati nstab li ma kienx konsiderevoli skont it-termini tal-EIS. Ġie konkluż ukoll li l-iskema li qed tiġi proposta huwa improbabbli li twassal biex jinkisru r-regolamenti nazzjonali.

## **9. Il-Karatteristiċi tal-Pajsaġġ/Baħar u Amenità Viżiva**

L-għan ta' dan ir-rapport kien li jiġi stabbilit l-impatt li jkollu l-iżvilupp li qed jiġi propost fuq il-pajsaġġ eżistenti u l-amenità viżiva tas-sit.

Ir-rapport inqasam f'żewġ partijiet; l-Evalwazzjoni tal-Pajsaġġ u l-Evalwazzjoni Viżiva. Ir-rapport kien jikkonsisti f'riċerka ta' publikazzjonijiet u stħarriġ fuq il-post li kien jinkludi stħarriġ fotografiku u kwestjonarju.

L-effetti fuq il-pajsaġġ huma dovuti għal bidliet fiżiċi lill-pajsaġġ, li jistgħu jwasslu biex jinbidel il-pajsaġġ u kif jiġi esperjenzat. Dan jista' jaffettwa l-valur mogħti lill-pajsaġġ.

L-effetti viżivi huma relatati ma' bidliet fuq l-għamla tal-veduti disponibbli minħabba li jsiru xi bidliet lill-pajsaġġ, minħabba r-reazzjoni tal-pubbliku għall-bidliet u minħabba l-effetti ġenerali li jikkonċernaw l-amenità viżiva.

Sar sħarriġ fuq Żona ta' Influenza Viżiva Teoretika (ZTVI) fi tliet punti tat-turbini; dawk ta' 6m, ta' 81.5m u ta' 163m skont dak li ntab mill-Awtorità Maltija għall-Ambjent u l-Ippjanar (MEPA) u dan sar fuq żona estiża ta' 25km 'il bogħod mis-sit tal-iżvilupp. Id-distanza intgħażlet biex tirrapreżenta l-aktar punt 'il bogħod mis-sit propost għall-iżvilupp, f'Malta stess. Intlaħaq qbil mal-MEPA fuq sittax-il punt ta' veduti biex jintużaw għall-evalwazzjoni tal-impatt viżiv, b'dawn il-punti juru l-impatt fuq is-sit minn distanzi qosra, medji u twal.

L-evalwazzjoni tal-valur tal-pajsaġġ uriet kif il-valur tal-pajsaġġ gie affettwat ħażin minn kważi kull punt ta' veduti li ntgħażel, u f'xi każijiet l-impatt kien ikbar milli f'oħrajn. F'żoni fejn hemm elementi qawwija naturali l-effett inħass iktar. Dan huwa dovut għall-fatt li l-pubbliku ifittex dawn iż-żoni għaliex huma assoċjati ma' trankwillità u ambjent kalm. Apparti minn hekk, il-kuntatt man-natura u l-ambjent misjuba f'dawn iż-żoni hija unika għal dawn il-postijiet partikolari. Intwera ukoll li f'postijiet li kellhom veduta simili tal-iżvilupp, iżda li kellhom karatteristiċi differenti fil-pajsaġġ ta' madwarhom, l-effett tal-iżvilupp inħass inqas milli fil-każ ta' dawk ssemma' qabel (eż. Il-Qala meta mqabbel mal-Qawra).

Ir-rizultati minn kwestjonarji kixfu t-tħassib ta' xi persuni. Dawn kienu jinvolvu l-biżgħa li t-turbini jaffettwaw il-veduta jew li jkunu koroh, li jkunu wisq ġo xulxin jew viċin ix-xatt, filwaqt li oħrajn kellhom tħassib fuq kemm dawn huma siguri. Xi persuni madankollu qalu ukoll li huma neċessarji minkejja li forsi jkunu koroh. Oħrajn kienu iktar kritiċi fir-risposti tagħhom billi qalu li hemm sorsi oħra ta' enerġija li jistgħu jintużaw. Oħrajn, l-iktar min-naħa ta' Pembroke, ħasbu li t-turbini se jkunu element interessanti f'pajsaġġ vojti.

L-evalwazzjoni tal-pajsaġġ uriet kif l-iżvilupp propost se jkollu minn impatt negattiv kbir sa impatt negattiv minuri fuq il-pajsaġġ eżistenti, b'dan jiddependi l-iktar fuq kemm ikun jidher u kemm ikunu qrib xulxin l-iżvilupp tat-turbini u l-pajsaġġ eżistenti. In-natura u d-daqs tal-iżvilupp jillimitaw il-miżuri ta' mitigazzjoni li jistgħu jinttieħdu prinċipalment minħabba regolamenti internazzjonali u lokali għas-sigurtà f'dan il-qasam u setturi oħra li huma involuti direttament f'dan il-proġett.

Iż-żona tal-iżvilupp mhix ikkunsidrata bħala Żona ta' Pajsaġġ b'Valur Għoli. L-evalwazzjoni viżiva uriet li l-iżvilupp se jkollu impatt konsiderevoli minn kważi kull punt ta' veduti li ntgħażel minkejja li l-veduta tinbidel minn kull punt. L-iżvilupp ma jħallix lok għal miżuri ta' mitigazzjoni l-iktar minħabba d-daqs tal-istrutturi u minħabba standards u regolamenti internazzjonali li jeżistu għal dan it-tip ta' żvilupp. Għaldaqstant l-unika miżura li potenzjalment tista' tintuża, iżda li ma ttaffix wisq l-effetti negattivi, hi dik tal-għażla tal-kuluri għall-istrutturi tal-iżvilupp. Dan jista' jwassal biex l-istrutturi jagħtu inqas fl-għajn milli kieku jintużaw kuluri li jispikkaw.

## 10. Ġeoloġija, Ġeomorfoloġija u Palaeontoloġija

Iż-żona għall-iżvilupp hija pajsagġ tal-art taħt l-ilma u nġhatat l-għamla tagħha minn proċessi ġeoloġiċi li seħhew meta l-pajsagġ kien għadu mikxuf fuq wiċċ il-baħar. Is-Sikka l-Bajda tikkonsisti f'biċċa għolja ta' qortin tal-Qawwi ta' Fuq li għandha morfoloġija irregolari. Din hija karatteristika ta' art tal-ġebel ikkarstifikat. Din l-art għandha preżenza qawwija ta' strutturi ta' sussidenza, erbgħa b'kollox, li jvarjaw mill-wisgħa tagħhom bejn 60m u 270m u li huma pjuttost immermra. Il-limiti tas-sikka fiha partijiet għoljin u weqfin li jikkorrispondu ma' xquq fil-blat normali, partijiet imtarrġa li ġew iffurmati fi żminijiet ta' livelli tal-baħar baxxi u instabbiltà tal-inklinazzjoni. Il-qiegħ tal-baħar madwar is-Sikka l-Bajda hu magħmul minn rqajja ta' sediment f'inklinazzjonijiet gradwali.

L-ikbar impatti negattivi assoċjati mal-iżvilupp propost jinkludu t-telf ta' stabbiltà tal-istrutturi ta' sussidenza u potenzjalment tal-qerda jew t-telf tal-istabbiltà tal-qortin taħt l-ilma. Impatti negattivi minuri jinvolvu l-ħolqien ta' skart mill-iskavar, nuqqas tal-istabbiltà tal-faċċata tal-irdum fit-tarf tas-Sikka l-Bajda kif ukoll kontaminazzjoni tas-sediment. Impatti negattivi insinnifikanti jinkludu t-telf ta' riżorsa minerali, disturb u erożjoni tas-sediment. Il-miżuri li qed jiġu proposti biex jittaffew dawn l-impatti jinkludu : (i) li jiġu mressqa t-turbini, (ii) l-għażla tal-pedamenti tat-turbini, (iii) li jsir pjan ta' ġestjoni tax-xogħolijiet tal-iskavar, (iv) li jsiru studji dettaljati fuq aspetti ġeofiżiċi u ġeotekniċi, (v) li skart tal-iskavar jintrema' f'miżbljet illiċenzjati inerti jew jiġi rriċiklat, (vi) li l-istallazzjoni u ż-żarmar tat-turbini tar-riħ isiru f'kundizzjonijiet ta' temp tajjeb, (vii) li l-pedamenti tat-turbini tiġi protetta b'ammont ta' ġebel, *grout-filled bags*, *concrete mattresses* u *anchored polypropylene fronds*, u (viii) li l-*cables* jitweħħlu fuq il-qiegħ.

Se jkun hemm impatt pożittiv kbir fil-ħarsien tal-qiegħ tal-baħar waqt il-fazi operazzjonali tal-iżvilupp propost.

## 11. Storbju

Iż-żona li qed tiġi proposta għall-iżvilupp tinstab f'bejn 1km u 3km il-barra mill-kosta. Ir-riċetturi sensitivi fil-vicin jinsabu f'żoni rurali u urbani fuq l-art. Il-ħsejjes tal-ambjent naturali fil-post tar-riċevituri sensitivi kienu prinċipalment ħsejjes tal-għasafar u l-insetti, ħsejjes ta' traffiku lokali u traffiku fil-bogħod, u ħsejjes tas-siġar u l-ħaxix li jvarjaw skont il-qawwa tar-riħ.

L-evalwazzjoni kkonkludiet li l-livelli ta' storbju, fl-inqas livell tagħhom, kienu oġhla mil-linji gwida għall-istorbju fil-komunità (50 dB A matul il-jum u 45 dB A matul il-lejl) li ġew stabbiliti mill-Organizzazzjoni Dinjija għas-Saħħa. Dan instab fir-riċetturi sensitivi kollha.

Il-livelli ta' storbju mbassra mhux se jilħqu l-livell ta' 75 dB A matul il-jum (għal postijiet abitati) waqt ix-xogħolijiet ta' kostruzzjoni fir-riċevituri sensitivi kollha, iżda se jkun hemm zieda fil-livelli ta' storbju fl-isfond waqt xogħolijiet ta' kostruzzjoni u l-effett dan se jkun:

- Buġibba – impatt żgħir
- Selmun – impatt moderat
- L-Aħrax tal-Mellieħa – impatt żgħir
- Kemmuna – impatt sostanzjali

Se jkun hemm impatt minimu ċar waqt il-faži operazzjonali fir-riċetaturi sensitivi kollha b' zieda ta' bejn 0.1 u 2.9 dB fil-livelli tal-istorbju fl-isfond. Huwa possibbli li jkun hemm impatt moderat fl-Aħrax tal-Mellieħa matul il-lejl b'zieda ta' bejn 3.0 u 4.9dB fil-livelli tal-istorbju fl-isfond.

Il-kalkoli għat-tbassir tal-istorbju saru filwaqt li gie kkunsidrat l-agħar każ possibbli fejn jidhlu l-iżvilupp tas-sit, fejn tinsab iż-żona u kemm tintuża.

Waqt l-evalwazzjoni, assumejna li l-istorbju tal-ambjent naturali f'kull post se jvarja skont l-attivitajiet li jkunu għaddejja fil-post waqt li jsiru x-xogħolijiet. F'żoni fejn hemm livelli ta' storbju relattivament kostanti (eż vicin triq traffikuża), il-livelli tal-istorbju se jibqgħu kostanti minħabba l-istorbju li jinħoloq mit-traffiku. F'żoni oħra fejn il-livelli ta' storbju mhux kostanti (eż żoni li jżuru n-nies), il-livelli tal-istorbju se jiddependu fuq l-ammont ta' nies li jżur il-post f'hinijiet partikolari.

Fejn jidhol storbju taħt l-ilma, ix-xogħolijiet tal-iskavar, tat-thammil, tat-tqeghid ta' ġebel u ta' *pile-driving*, jistgħu jwasslu għall-impatt fiżiċi fuq l-ispeċi tal-baħar u l-imġieba tagħhom. Min-naħa l-oħra, storbju tat-turbini waqt il-faži operazzjonali jista jwassal sabiex xi speċi partikolari ikollhom bidla fl-imġieba minħabba frekwenzi baxxi.

L-impatti mill-vibrazzjonijiet mhux se jinħassu min-nies u mhux se jkun hemm effett fuq il-bini fir-riċetturi meqjusa sensitivi.

## **12. Siti arkeoloġiċi u kulturali jew storiċi**

Minħabba l-possibiltà li jistaw jinstabu xi fdalijiet arkeoloġiċi fis-sit tal-iżvilupp tas-Sikka l-Bajda, saret evalwazzjoni dwar il-potenzjal tal-wirt arkeoloġiku u kulturali ta' taħt il-baħar.

Ma nstabet l-ebda evidenza dokumentata mill-passat li hemm fdalijiet arkeoloġiċi fiż-żona kkonċernata. Peress li f'din iż-żona qatt ma sar tiftix, sar stħarriġ tal-qiegħ il-baħar permezz *side scan sonar* li ta stampa b'riżoluzzjoni għolja taż-żona kollha sabiex jiġu mfittxija fdalijiet arkeoloġiċi.

Ir-riżultat ta' dan l-istħarriġ ma wera l-ebda fdalijiet arkeoloġiċi viżibbli. Madankollu, instab li l-biċċa l-kbira taż-żona hija mgħottija minn Posidonja li possibbilment tgħatti xi siti u/jew oġġetti ta' importanza arkeoloġika. Żoni mgħottija minn Posidonja għandhom ċans ikbar li jwasslu għas-sejba ta' fdalijiet antiki taħthom, minħabba li l-qiegħ tal-baħar taħthom ma jkunx intmess.

Minn dawn ir-riżultati jidher li ma se jkun hemm l-ebda impatt evidenti fuq fdalijiet arkeoloġiċi li jinsabu taħt il-baħar. Madankollu, minħabba n-natura ta' qiegħ il-baħar qed jiġi ssuġġerit li meta jiġu deċiżi l-pożizzjonijiet eżatti tat-turbini, tal-arblu tar-riħ u tat-*transformer platform*, is-sediment għandu jiġi eżaminat sabiex jiġi żgurat li l-ebda siti arkeoloġiċi ma jintradmu taħthom. Ix-xogħolijiet kollha ta' skavar u/jew tiftix li jsiru fuq is-sit xorta għandhom jiġu mmoniterati minn arkeologu kkwalfikat taħt id-direzzjoni tas-Sovrintendenza tal-Patrimonju Kulturali.

### 13. Impatti fuq il-Popolazzjonijiet Umani

Il-*wind farm* fis-Sikka l-Bajda propost fil-Grigal ta' Malta, se jkun jinsab fil-pajsaġġ ta' żoni residenzjali b'veduti tal-baħar u stabbilimenti għat-turisti fl-Għadira u San Pawl il-Baħar, u fil-lokalitajiet tal-Mellieħa, Buġibba, l-Qawra, Għajnsielem u l-Qala. Dawn iż-żoni jiġu ffrekwentati l-iktar minn turisti barranin u kif ukoll lokali, hemm numru ta' kmamar għad-dgħajjes, żoni għal *picnics* u *caravans*, *bungalows*, lukandi, *bars* u ristoranti, kiosks, kmamar ta' mal-baħar mibnija llegalment u binjiet residenzjali.

L-analiżi tal-istħarriġ jindika li kemm ir-residenti u kemm il-vizitaturi kellhom l-impresjoni li ffit se jkun hemm fatturi pożittivi li jinkisbu direttament mill-iżvilupp tal-*wind farm*. Fil-fatt, waqt it-tqassim tal-kwestjonarju, numru kbir ta' parteċipanti għazlu li ma jikkollaborawx. Dan l-aġir jista' jkun li hu dovut għan-nuqqas ta' informazzjoni li għandu l-pubbliku ingenerali jew possibbilment minħabba nuqqas ta' fiduċja lejn l-awtoritajiet pubbliċi fejn jidhlu proġetti nazzjonali u l-istudji xjentifiċi assoċjati ma' dan l-iżvilupp. Uħud minn dawn il-kwistjonijiet jistgħu jingħelbu billi jiżdied l-għarfien u l-komunikazzjoni mal-partijiet kollha kkonċernati.

L-iżvilupp propost mistenni li joħloq impatti negattivi u pożittivi fuq il-popolazzjoni umana waqt fażijiet differenti tal-proġett. L-impresjoni li ttieħdet mill-istħarriġ mal-pubbliku u partijiet involuti kien li l-impatt ġenerali se jkun negattiv. Issemmew impatti negattivi viżivi, ta' storbju u telf ta' spazju miftuħ fuq il-baħar. NGOs, speċjalment dawk li jaħdmu favur l-ambjent, kienu mħassba ukoll fuq l-impatt li l-proġett se jkollu fuq l-abitati tal-baħar u l-għasafar. Il-partiċipanti rnexxielhom jidentifikaw element pożittiv, li kien il-ħolqien ta' impjiegi. Għalkemm dawk mistoqsija ħasbu li se jkun hemm *shadow flicker*, l-istudji tekniċi urew li dan mhux se jkun il-każ.

### 14. Effetti sekondarji u kumulattivi



Se jinholqu numru ta' impatti sekondarji fil-fażijiet kollha tal-proġett. L-impatti se jkunu l-iktar ta' natura pożittiva u mil-lat ekonomiku hekk kif jinholqu minn bżonnijiet tal-proġett stess; bżonn għal bini, manutenzjoni, impjegi temporanji u permanenti u fis-servizzi ta' konsulenza fost oħrajn.

Hemm ukoll il-potenzjal li xi materjal li jittiehed miż-żona jintuża fuq l-art. Dan ifisser li jżiedu r-rizorsi tal-art u dan huwa impatt pożittiv. Madankollu f'każ li dan il-materjal jintrema' fil-baħar, dan ikollu effett negattiv fuq l-ambjent ta' qiegħ il-baħar u l-ilma tal-madwar.

Il-fażijiet differenti tal-iżvilupp jistgħu ukoll ikollhom impatt fuq ix-xiri tal-karburant għall-bastimenti minhabba li jkollhom jiehdu rotot itwal. Minhabba zieda fil-ħruq tal-karburanti se jkun hemm ukoll iktar tniġġis.

Impatti sekondarji huma mistennija li jaffettwaw l-industrija tal-akwakultura fil-viċin, minhabba l-ispejjeż żejda biex jinkiseb aċċess għal sit ġdid. L-ambjent betniku eżistenti ta madwar il-*fish farms* mistenni li jitjeb maż-żmien, filwaqt li s-siti il-godda mistennija jesperjenzaw effett oppost.

Il-faži tat-tneħħija se jkollha impatti simili għal tal-kostruzzjoni, għalkemm jista' jkun hemm opportunita' għal dħul għal kumpaniji tal-ġestjoni tal-iskart li jixtru l-materjal tat-turbini għar-riċiklaġġ, u b'dan joħloq effett ekonomiku ieħor li ma jkunx seħħ fil-faži tal-ftuħ.

L-effetti kumulattivi mill-iżvilupp jikkonċernaw aspetti viżivi, impatti fuq il-pajsaġġ kif ukoll ekoloġiċi. Turbini oħra li jidhru u/jew it-tkabbir ta' dan l-iżvilupp jista' jwassal għal effetti kumulattivi li għalissa mhumiex previsti.

Il-fatt li se jiġu affettwati l-ispeċi tal-baħar minhabba ħut u l-provvista ta' ikel, jista jkun hemm impatt fuq xi għasafar li jużaw din iż-żona biex jieklu u biex jistrieħu fl-ilma. Dan jista' jhalli impatt ieħor fuq speċi li jużaw dan is-sit għat-tagħmir.

Li jiġu identifikati fdalijiet arkeoloġiċi waqt kwalunkwe faži tal-iżvilupp, u li potenzjalment jinkisbu dawn il-fdalijiet jew anke t-tħaffir tas-sit jistgħu iħallu effett fuq komunitajiet ta' qiegħ il-baħar li jinsabu fiż-żona u li jkunu diġa' ġew affettwati mill-bastimenti ta' kostruzzjoni/tneħħija u/jew mill-installazzjoni tat-turbini. Kull attività li ssir f'qiegħ il-baħar apparti dawk li ssemew fir-rigward tal-iżvilupp li qed jiġi propost u li jista' jkollha impatt ieħor fuq il-komunitajiet betniċi, m'għandhiex issir qabel ma ssir evalwazzjoni adegwata minn qabel.