**Questionnaire for companies involved in the circular economy of electrical machines**

***Contact***: Please email your responses to Dr Jill Miscandlon, jill.miscandlon@strath.ac.uk

***Aim***: To understand the state of remanufacturing and reuse of electrical machine in the UK supply chain

***Introduction****:* A brief introduction to the research activities of the EPSRC Future Electrical Machine Manufacturing Hub can be accessed from our website: <https://electricalmachineshub.ac.uk/>

***Description of company***:

|  |  |
| --- | --- |
| Name of company | Click or tap here to enter text. |
| Location | Click or tap here to enter text. |
| Size (no. of employees) | Click or tap here to enter text. |
| Contact email | Click or tap here to enter text. |

1. Which of these are applicable scenarios for manufacturing electrical motors/components in your organisation?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector/Rating** | **Up to 100 kW** | **100-500 kW** | **500 kW – 1 MW** | **Larger than 1 MW** |
| Aerospace |[ ] [ ] [ ] [ ]
| Automotive |[ ] [ ] [ ] [ ]
| Wind |[ ] [ ] [ ] [ ]
| Marine |[ ] [ ] [ ] [ ]
| Rail |[ ] [ ] [ ] [ ]
| Off-road vehicles |[ ] [ ] [ ] [ ]
| Other, please specify | [ ]  |[ ] [ ] [ ]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector/Volume** | **Less than 10 machines/month** | **11-50 machines/month** | **51-100 machines/month** | **More than 100 machines/month** |
| Aerospace |[ ] [ ] [ ] [ ]
| Automotive |[ ] [ ] [ ] [ ]
| Wind |[ ] [ ] [ ] [ ]
| Marine |[ ] [ ] [ ] [ ]
| Rail |[ ] [ ] [ ] [ ]
| Off-road vehicles |[ ] [ ] [ ] [ ]
| Other, please specify | [ ]  |[ ] [ ] [ ]

2. What type of motors are processed in your business?

 [ ]  Permanent magnet [ ]  Squirrel Cage Induction

 [ ]  Switched Reluctance [ ]  Synchronous Reluctance

 [ ]  Other, please specify: Click or tap here to enter text.

3. In terms of repair and/or replacement of motors, which components do you remanufacture/ recycle etc?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Component** | **Recycle** | **Remanufacture/ Refurbish** | **Reuse/ Redistribute** | **Maintain/ Prolong** | **Scrap** |
| Coils |[ ] [ ] [ ] [ ] [ ]
| Magnets |[ ] [ ] [ ] [ ] [ ]
| Laminations |[ ] [ ] [ ] [ ] [ ]
| Housings/casings |[ ] [ ] [ ] [ ] [ ]
| Power electronics |[ ] [ ] [ ] [ ] [ ]
| Auxiliaries |[ ] [ ] [ ] [ ] [ ]
| Other, please specify: |[ ] [ ] [ ] [ ] [ ]
|  | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |

4. In relation to your answers to number 3, what methods do you use to remanufacture/recycle etc? Do you use manual or automated processes?

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Manual** | **Automated** | **Process** |
| Coils |[ ] [ ]  Click or tap here to enter text. |
| Magnets |[ ] [ ]  Click or tap here to enter text. |
| Laminations |[ ] [ ]  Click or tap here to enter text. |
| Housings/casings |[ ] [ ]  Click or tap here to enter text. |
| Power electronics |[ ] [ ]  Click or tap here to enter text. |
| Auxiliaries |[ ] [ ]  Click or tap here to enter text. |
| Other, please specify: |[ ] [ ]  Click or tap here to enter text. |

5. Do you currently employ digital solutions in your business, or would you be interested to employ in the future if it could aid in the reuse of electrical machine components?

If yes then, please tick the appropriate technologies:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Technology** | **Yes**, currently employed | **Yes**, in the process of being implemented | **No**, but interested in employing in the future | **No**, not interested in employing in the future |
| Sensors |[ ] [ ] [ ] [ ]
| Data from sensors |[ ] [ ] [ ] [ ]
| Machine learning |[ ] [ ] [ ] [ ]
| Computer vision |[ ] [ ] [ ] [ ]
| Simulation & Digital twin |[ ] [ ] [ ] [ ]
| Robotics |[ ] [ ] [ ] [ ]
| Additive Manufacturing |[ ] [ ] [ ] [ ]

6. Do you have any other comments about the circular economy of electrical machines?

Are there barriers to your company getting involved in CE activities?

Do you have any issues/worries about getting involved with CE activities for electrical machines?

Thank you very much for your time in completing this survey.