Appendices
Appendix I: Interview questions

1. What is the potential of PAT scheme in climate change mitigation? Is the scheme picking up?
2. What is the difference between the two cycles of PAT? What changes were brought about?
3. Are the industries geared up enough to achieve the carbon intensity reduction target of India as proposed in the INDC? How prepared are we?
4. Which of the highly carbon intensive industry has taken significant steps to reduce their emissions?
5. Will the new climate targets affect the domestic and international competitiveness of the industries? To what extent?
6. What would be the financial cost and implications for industry of reducing emissions? Or is it the long term gain that will matter?
7. What do you think technology transfer, the buzz word in the climate negotiations, will achieve? Do we really need technology transfer and at what cost?
8. What are your major concerns?
9. Will India be able to decouple carbon emissions from development?
10. Energy sector contributes 71 per cent to India’s emission and also has the largest scope for mitigation. What would you suggest as future policy changes that significantly reduce emissions without particularly impacting the industries on the whole?
11. In the PAT scheme we have to reduce SEC & in the EU system absolute emission has to reduce. According to you which one is better or more industry friendly?
12. Should Designated Consumers adopt new technology to achieve the PAT target or should they buy ESCerts? Which one is the better option for the industry?
13. What happen to Medium and small scale unit as we have more MSE in iron & steel and cement industry? Can they adopt the technology or shut down or we have other options to overcome?
14. Can India fulfil its commitments for 2030?
15. How will the economic slowdown in the world impact the carbon emissions?
Note: The interview questions as mentioned here are a general format. The actual interviews consisted of several supplementary questions or questions arising out of answers, and discussions on the topic of expertise of the interviewee.
# Appendix II: List of Interviewees

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. K.K Chakarvarti</td>
<td>Energy Economist, Bureau of Energy Efficiency (BEE), Ministry of Power, New Delhi, India.</td>
</tr>
<tr>
<td>Dr. Jyoti Parikh</td>
<td>Executive Director, Integrated Research and Action for Development (IRADe)</td>
</tr>
<tr>
<td>Ms. Ritu Bharadwaj</td>
<td>Senior Program Manager, Institute for Industrial Productivity, New Delhi, India.</td>
</tr>
<tr>
<td>Dr. Ritu Mathur</td>
<td>Director, Green Growth and Resource Efficiency, TERI, New Delhi, India</td>
</tr>
<tr>
<td>Mr. Karthik Ganeshan</td>
<td>Senior Research Associate, Council on Energy, Environment and Water (CEEW), New Delhi, India.</td>
</tr>
<tr>
<td>Dr. Himangana Gupta</td>
<td>Programme officer, Project Management Unit, India's Third National Communication to the UNFCCC (NATCOM), Ministry of Environment, Forest and Climate Change, New Delhi.</td>
</tr>
<tr>
<td>Mr. Sanjeev Bansal</td>
<td>Project Engineer, Punjab Energy Development Agency (PEDA), Chandigarh, India.</td>
</tr>
<tr>
<td>Mr. Mahesh Ponia</td>
<td>Guru Gobind Singh super thermal power plant, Ropar, Punjab</td>
</tr>
<tr>
<td>Mr. N Vasumahadevan</td>
<td>Mr N Vasudevan, Fellow, TERI, New Delhi</td>
</tr>
<tr>
<td>Mr. Suwit Khunkitti</td>
<td>Former Deputy Prime Minister &amp; Minister Ministry of Natural Resource and Environment, Thailand.</td>
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<tr>
<td>Professor Jürgen-Fr. Hake</td>
<td>Head, Systems Analysis and Technology Evaluation Institute of Energy and Climate Research (IEK-STE) Forschungszentrum Jülich, Germany</td>
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<tr>
<td>NTPC</td>
<td>-</td>
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<tr>
<td>SAIL</td>
<td>-</td>
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Appendix III: List of companies and plants taken for the study

Iron & steel (2-Digit NIC code - 24)

1. Balasore Alloys Limited
2. Bhushan Steel Limited
3. Gallent Metal Limited
4. Godavari Power & Ispat Ltd
5. Indian Metal & Ferro Alloys Limited
6. Jai Balaji Industries Limited
7. Jayaswal Neco Industries Limited
8. Jindal Steel & Power Limited
9. JSW Steel Limited
10. M/S Mukund Limited
11. MSP Steel & Power Limited
12. Navbharat Ventures Limited
13. Neelachal ISPAT Nigam Limited
14. Rashtriya Ispat Nigam Limited
15. SAIL
16. Sunflag Iron & Steel Company Limited
17. Tata Steel Limited
18. Tata Sponge Iron Limited
19. Llyods metals and Energy Limited
20. VISA Steel Limited
21. Welspun Corp Limited
22. Usha Martin Limited
Cement (2-Digit NIC code - 23)

1. ACC Limited
2. Ambuja Cement Limited
3. Birla Corporation Limited
4. Binani Cement Limited
5. Chettinad Cement Corporation Limited
6. Century Cement
7. Dalmia Cement (Bharat) Limited
8. DCM Shriram Consolidated Ltd
9. Gujarat Sidhee cement Limited
10. Heidelberg Cement India Ltd
11. Jaiprakash Associates Limited
12. JK Lakshmi Cement Ltd
13. JK Grey Cement Ltd.
14. JK white Cement
15. Kalyanpur Cements Limited
16. Kesoram Cement Ltd
17. Madras Cements Ltd
18. Mangalam Cement Limited
19. OCL India Limited
20. Prism cement Limited
21. Sanghi Industries Limited
22. Saurashtra Cement Limited
23. Tata Chemicals Limited
24. Ultratech Cement Limited
<table>
<thead>
<tr>
<th>Number</th>
<th>Thermal Power Plant</th>
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<tbody>
<tr>
<td>1</td>
<td>Anpara Thermal Power Station</td>
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<tr>
<td>2</td>
<td>Amarkantak Thermal Power Station</td>
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<td>3</td>
<td>Bokaro Thermal Power Station</td>
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<td>4</td>
<td>Budge Budge Thermal Power Station South 24 Parganas West Bengal</td>
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<td>5</td>
<td>Chandrapura Thermal Power Station</td>
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<tr>
<td>6</td>
<td>Chandrapur Super Thermal Power Station</td>
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<td>7</td>
<td>Dahanu Thermal Power Station</td>
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<tr>
<td>8</td>
<td>Dr. Shyamaprasad Mukharjee Thermal Power Station</td>
</tr>
<tr>
<td>9</td>
<td>Ennore Thermal Power Station</td>
</tr>
<tr>
<td>10</td>
<td>Gandhinagar Thermal Power Station</td>
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<tr>
<td>11</td>
<td>Guru Gobind Singh Super Thermal Power Station</td>
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<tr>
<td>12</td>
<td>Guru Hargobind Thermal Power Plant</td>
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<td>13</td>
<td>Guru Nanak Dev Thermal Plant</td>
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<td>14</td>
<td>Hasdeo Thermal Power Station</td>
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<td>15</td>
<td>IB Thermal Power Station</td>
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<td>16</td>
<td>Khaperkheda Thermal Power Station</td>
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<td>17</td>
<td>Korba (East) Thermal Power Station</td>
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<tr>
<td>18</td>
<td>Kothagudam Thermal Power Station (Combined, 720 MW)</td>
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<tr>
<td>19</td>
<td>Kothagudam Thermal Power Station Stage V (500 MW)</td>
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<tr>
<td>20</td>
<td>Kota Super Thermal Power Station</td>
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<tr>
<td>21</td>
<td>Koradi Thermal Power Station,</td>
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<tr>
<td>22</td>
<td>Mettur Thermal Power Station</td>
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<td>23</td>
<td>Nasik Thermal Power Station</td>
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<td>24</td>
<td>New Parli Thermal Power Station</td>
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<tr>
<td>25</td>
<td>North Chennai Thermal Power Station</td>
</tr>
<tr>
<td>26</td>
<td>NTPC Ltd. Ramagundam Super Thermal Power Station</td>
</tr>
</tbody>
</table>
27  NTPC-Simhadri
28  NTPC Ltd- Kahalgaon
29  NTPC Ltd-Sipat
30  NTPC SAIL Power Co. Pvt. Ltd.
31  NTPC Ltd-Badarpur
32  NTPC Ltd -Vindhyachal
33  NTPC Ltd -Talcher Kaniha
34  NTPC Ltd-Talcher Thermal
35  NTPC Ltd - Dadri
36  NTPC Ltd-Rihand
37  NTPC Ltd- Singrauli
38  NTPC Ltd -Tanda
39  NTPC Ltd- Unchahar
40  NTPC Ltd -Farakka
41  Paras Thermal Power Station
42  Panipat Thermal Power Station
43  Rajghat Power House
44  Raichur Thermal Power Station
45  Ramagundam Thermal Power Station
46  Rayalaseema Thermal Power
47  Sagardighi Thermal Power Station
48  Sanjay Gandhi Thermal Power Station
49  Satpura Thermal Power Station
50  Sikka Thermal Power Station
51  Southern Replacement Thermal Power Station
52  Suratgarh Super Thermal Power Station
53  Toranagallu Thermal Power Station (600 MW)
54 Toranagallu Thermal Power Station (260 MW)
55 Titagarh Thermal Power Station
56 Trombay Thermal Power Station
57 Tuticorin Thermal Power Station
58 UKAI Thermal Power Station
59 Vijaywada (Dr. Narla Tata Rao) Thermal Power Station
60 Wanakbori Thermal Power Station
Appendix IV: List of plants under the companies taken for the study as per PAT notifications

Iron & steel Sector

1. Balasore Alloys Limited Balgopalpur, Balasore Odisha
2. Bhushan Steel Limited
   - Bhushan Steel Limited Raigarh, Maharashtra
   - Bhushan Steel Limited 23, Site-iv, Sahibabad, Uttar Pradesh
3. Gallent Metal Limited, Village Samakhyali, Taluka Bhachau, Kutch, Gujarat
4. Godavari Power & Ispat Ltd.
   - Godavari Power & Ispat Ltd. Plot No. 428/2, Phase -1,Industrial Area, Siltara, Raipur, Chhattisgarh
   - Hira Power & Steel Ltd. Urd Industrial Complex, Raipur Chhattisgarh
   - Hira Ferro Alloy Ltd. Plot nos. 567 B, 568 & 553 B, Urla industrial Complex, Raipur, Chhattisgarh
5. Indian Metal & Ferro Alloys Limited, Kalia Pani, Sukinda, Jajpur, Odisha
7. Jayaswal Neco Industries Limited, Siltara, Raipur Chhattisgarh
8. Jindal Steel & Power Limited, Kharsia Road, Raigarh Chhattisgarh
9. JSW Steel Limited
   - Welspun Maxsteel Ltd. Salav, Raigarh, Chhattisgarh
   - JSW Nagpur, Maharashtra.
   - JSW Vasind, Maharashtra
10. M/S Mukund Limited, Thane- Belapur road, Dighe Kalwa, Maharashtra
11. MSP Steel & Power Limited Raigarh, Chhattisgarh
12 Navbharat Ventures Limited

13 Neelachal ISPAT Nigam Limited Kalinga Nagar, Duburi, Jajpur, Odisha

14 Rashtriya Ispat Nigam Limited Vizag, Andra Pradesh

15 SAIL

- Rourkela Steel Plant Rourkela Odisha
- Bokaro Steel Plant Ispat Bhawan, Bokaro steel city Jharkhand
- Bhilai Steel Ltd Bhilai Chhattisgarh
- Durgapur Steel Plant Durgapur, Burdwan, West Bengal
- Burdwan Burnpur near Asansol, Distt. Burdwan, West Bengal
- Visvesvaraya Iron and Steel Plant Bhadravathi, Shimoga, Karnataka

16 Sunflag Iron & Steel Company Limited, Bhandara Road, Nagpur Maharashtra

17 Tata Steel Limited Bistupur, Jamshedpur Jharkhand

18 Tata Sponge Iron Limited P.O. Joda, Dist- Keonjher, Odisha

19 Llyods metals and Energy Limited, Ghugus, Chandrapur, Maharashtra

20 VISA Steel Limited Kalinganagar Industrial complex, Odisha

21 Welspun Corp Limited

- Welspun Steels Ltd. Welspun City, Survey No.650/652, Village-Versamedi TA-Anjar (Kutch) Gujarat
- Welspun Corp Ltd. Welspun City, Survey No.665, Village-Versamedi TA-Anjar (Kutch) Gujarat

22 Usha Martin Limited, Aditya Industial, Gamharia, Jharkhand
Cement Sector

1. ACC Limited
   - (Gagal Cement Works -1) P.O. Barmana, Distt. Bilaspur, Himachal Pradesh (PPC) Plants
   - (Gaga! Cement Works-II) P.O.Barmana, Distt Bilaspur, Himachal Pradesh (PPC) Plants
   - (Wadi Cement Works) Wadi, Distt. Gulbarga Karnataka (PPC) Plants
   - (Chanda Cement Works) Cement nagar, Dist. Chandurpur, Maharashtra (PPC) Plants
   - Kymore Cement Ltd. Tehsil-Vijraghavegarh Distt. Katni, Madhya Pradesh (PPC) Plants
   - Bargarh Cement Works Cement Nagar, PO- Bardol, Dist. Bargarh, Odisha (PPC) Plants
   - Lakheri Cement works, Dist.- Bundi, Rajasthan (PPC) Plants
   - Jamul Cement Works, District Durg, Chhattisgarh (PSC) Plants
   - Chaibasa Jinkpani Dist. Singhbnoom, Jharkhand (PSC) Plants
   - Madukkari Cement Works, Dist.Coimbatore Tamil Nadu (Wet Cement Plants)
   - Tikaria Cement Works, Gauriganj District-Chhatrapati Shahuji Maharaj Nagar, Uttar Pradesh (Grinding Plants)

2. Ambuja Cement Limited
   - Bhatapara Cement Works, Rawan Tehsii Baloda Bazar Distt. Raipur Chhattisgarh (PPC) Plants
   - Ambujanagar, Tal-Kodinar, Disttt. Junagadh, Gujarat (PPC) Plants
   - Suli, Darlaghat, Tehsil Arki Disttt. Solan-171102 Himachal Pradesh (PPC) Plants
   - Maratha Cement Works, Village Upparwahi, Taluka Korpana, Disttt.
Chandrapur, Maharashtra (PPC) Plants

- Rabriyawas Teh Jaitaran, Distt. Pali, Rajasthan (PPC) Plants
- Ropar Vill. Doburji, Lodhima jra Distt. Ropar, Punajb (Grinding Plants)

3 Birla Corporation Limited

- Satna Cement Works, P.O. Birla Vikas, Distt. Satna, Madhya Pradesh(PPC) Plants
- Chittorgarh Sector-3, Madhav Nagar, Cement Factory, Chanderia - 312021 Distt. Chittorgarh Rajasthan (PPC) Plants
- Chanderia cement Ltd., Chittorgarh Sector-3, Madhav Nagar, Cement Factory, Chanderia, Distt. Chittorgarh Rajasthan (PPC) Plants

4 Chettinad Cement Corporation Limited

- DindigulRani Meyamrnai Nagar, Karikkali Post, Guziliamparai (VIA), Dindigul Distt., Tamil Nadu (PPC) Plants
- Puliyur Kumara rajah Muthiah Nagar, Puliyur, Karur Distt. Tamil Nadu (PPC) Plants

5 Century Cement Limited

- Century Cement, Baikunth, Distt. Raipur, Chhattisgarh (PPC) Plants
- Manikgarh Cement, Chandrapur Post-Gadchandur Tah.Korpana Distt. Chandrapur Maharashtra (PPC) Plants
- Maihar Cement_Unit-II
- Satna Post-Sarlangar Maihar Distt. Satna Madhya Pradesh (PPC) Plants
- Satana Post-sarlangar maihar Distt. Satna Madhya Pradesh, (PPC) Plants

6 Dalmia Cement (Bharat) Limited, Trichy Dalmiapuram, Tamil Nadu (PPC)

7 DCM Shriram Consolidated Ltd, Kota Shriram nagar Distt. Kota Rajasthan

8 Gujarat Sidhee Cement Limited, Junagarh Gujarat (OPC) Plants

9 Heidelberg Cement India Ltd
• Heidelberg Cement India Ltd, Distt. Tumkur, Karnataka (PSC) Plants
• Diamond Cement Prop. Heidelberg Cement, Damoh' Village Narsingarh Distt. Damoh Madhya Pradesh (Clinkerization Plant)

10 Jaiprakash Associates Limited (Jaypee)
• Bela plant, Jaypeenagar Distt. Rewa Madhya Pradesh (PPC) Plants
• Rewa plant Rewa, Jaypeenagar Distt. Rewa Madhya Pradesh (PPC) Plants
• Dalla Cement Factory (Unit of Jaiprakash Associates Limited) S.H. 5 kota P.O. Dalla Distt. Sonebhadra Uttar Pradesh (PPC) Plants

11 JK Lakshmi Cement Ltd, Sirohi, Jaykaypuram Rajasthan (PPC)

12 JK Cement Ltd.
• JK white Cement, Nagaur Gotan, Distt. Nagaur Rajasthan (White Cement Plants)
• JK Cement limited, Nimbahera, Kailash Nagar-I, Nimbahera Distt. Chittorgarh, Rajasthan (PPC) Plants

12 Kalyanpur Cements Limited, Bihar, Banjari Distt. Rohtas, Bihar (PPC)

14 Kesoram Cement Limited
Kesoram Cement (Prop. Kesoram Industries Ltd.,) Basantnagar, Distt. Karimnagar, Andhra Pradesh (PPC) Plants
Vasavadatta Cement, Gulbaraga Sedam, Distt. Karnataka

15 Madras Cements Ltd, Ariyalur, Chennai, Tamil Nadu (PPC) Plants

16 Mangalam Cement Limited, Kota, Rajasthan (PPC) Plants

17 OCL India Limited, Dist. Sundergarh, Odisha (PSC) Plants

18 Prism cement Limited, Rampur, Madhya Pradesh (PPC) Plants

19 Sanghi Industries Limited, Kutch, Gujarat (OPC) Plants

20 Saurashtra Cement Limited, Ranavav Distt. Porbandar Gujarat (OPC)
21 Tata Chemicals Limited, Mithapur Distt. Jamanagar, Gujarat (OPC) Plants

22 Ultratech Cement Limited

- Hirmi Cement Works, Hirmi, Distt. Raipur Chhattisgarh (PPC) Plants
- Rawan cement Works Grasim Vihar Vill., Rawan Tehsil Sigma Distt. Raipur, Chhattisgarh (PPC) Plants
- Awarpur Cement Works, Awarpur Cement Project, Taluka: Korpana, Distt. Chandrapur, Maharashtra (PPC) Plants
- Vikram cement Works, Khor, Distt. Neemuch Madhya Pradesh (PPC) Plants
- Aditya Cement Works, Adityapuram Sawa - Shambhupura Road Distt. Chittorgarh, Rajasthan (PPC) Plants
- Kotputli cement Works, Mohanpura, Tehsil Kotputli Distt. Jaipur, Rajasthan (PPC) Plants
- Reddipalyam Cement Works, Reddipalyam Distt. Ariyalur, Tamil Nadu (PPC) Plants
- OPC (Gujrat Cement Ltd.) Village Kovaya, Taluka Rajula City, Distt. Amreli, Gujarat (OPC) Plants
- OPC (Naramada Cement) P.B.no-10, Babarkot Village, Distt. Amreli Gujarat (OPC) Plants
- OPC (Rajshree Cement Works) Adityanagar Malkhed Road, Distt. Gulbarga Karnataka (OPC) Plants
- PSC (AP Cement Works) Bhogasamudram, Tadipatri, Anantapur Distt. Andhra Pradesh (PSC) Plants
- White cement plants Unit- Birla White D-7 Shastri Nagar Jodhpur, Rajasthan (White Cement Plants)