India's Residential Air Conditioning: A Citywise Fact Sheet

iFOREST Global conducted a cross-sectional survey covering over 3,100 households from seven major Indian cities—Delhi, Mumbai, Kolkata, Chennai, Ahmedabad, Pune, and Jaipur using stratified random sampling across income groups and climate zones, with 95% confidence and 5% margin of error for national estimates. The study examined AC ownership patterns, drivers behind purchasing decisions, daily usage, servicing experiences, refrigerant leakage and costs, disposal habits, and consumer awareness regarding energy and climate-friendly options. Findings aim to inform the development of a robust lifecycle refrigerant management (LRM) roadmap for sustainable cooling and climate-friendly transition in India, focusing on the perspectives of household decision-makers and AC users. Here are the distinct profiles of seven cities in AC ownership, efficiency choices, refilling practices, and consumer preferences compared to national trends.

Key Takeaways for Delhi:

1. **Most Delhi households own just one AC:** In Delhi, 94% of households owning ACs have just one unit, while only 6% own more than two. Nationally, 87% own one AC, and 13% own more than two.

2. **1.5 TR or smaller units dominate in Delhi:** About 94% of ACs in Delhi are 1.5 TR or smaller, with only 6% above 2 TR. Nationally, 93% are 1.5 TR or less, while 7% are above 2 TR.

3. **Delhi households keep their ACs to lower temperature settings:** Nearly 51% of households set their ACs at 23–24°C, and 31% keep it at 22°C or below. Nationally, 47% prefer 23–24°C, while 33% keep it at 22°C or less.

4. **Energy-efficient ACs dominate in Delhi:** Around 97% of households own 3-star to 5-star rated ACs, compared to 98% nationally. Delhi leads in 3-star ownership, with 68% of households opting for them—the highest in the country.

5. **Delhi's AC usage matches the national average:** On average, households in Delhi use their ACs for 3.9 hours per day, equal to the national figure.

6. **Refrigerant refilling is a major complaint:** In Delhi, 78% of AC service complaints are about unnecessary refrigerant refills, while 22% relate to unresolved problems. Nationally, 68% of complaints are about refilling and 32% about unresolved issues.

7. **High refrigerant refill rate:** In Delhi, around half of the ACs refill refrigerant every year , similar to national refrigerant refill rate of 41%.

8. **Refilling costs in Delhi are high and uniform:** The cost of refrigerant refilling per AC in Delhi is ₹2,200, the same as the national average.

9. **Company technicians are more trusted in Delhi:** About 61% of households prefer company technicians for servicing, while 39% rely on local ones. Nationally, 44% prefer local technicians and 56% company technicians.

Key Takeaways for Mumbai

1. **Single AC ownership dominates:** Among AC-owning households, 95% own just one AC, while 5% own more than two. This is higher than the national trend, where 87% own one AC and 13% own more than two.

2. **Mumbai sets cooler temperatures:** Nearly 26% of AC-owning households in Mumbai set their ACs below 20°C—much higher than Ahmedabad, Chennai, and Kolkata, and well above the national average of 9%.

3. **High preference for energy efficiency:** Around 35% of Mumbai households own 5-star ACs, the highest among all surveyed cities and above the national average of 28%.

4. **Usage patterns align with national levels:** On average, households in Mumbai use ACs for 3.5 hours per day, comparable to the national level of 3.9 hours.

5. **High refrigerant refilling rate:** In Mumbai, 37% of ACs refill refrigerant every year, similar the national refilling rate of 41% ACs. The average cost of refilling is ₹2,200 per AC, the same as the national average.

6. **Unnecessary refrigerant refilling is a major servicing complaint:** In Mumbai, 42% of service complaints are about unresolved problems, while 58% are about unnecessary refrigerant refilling. Nationally, the trend is reversed, with 32% linked to unresolved problems and 68% to unnecessary refilling.

7. **High reliance on both local and company technicians for AC servicing:** In Mumbai, 47% of households prefer local technicians for servicing, while 53% rely on company technicians. Nationally, 44% prefer local technicians.

Key Takeaways for Kolkata:

1. **Most households own just one AC:** In Kolkata, 83% of households owning AC, have single unit, while 17% own more than two. Nationally, 87% own one AC and 13% own more than two.

2. **1.5 TR ACs dominate:** Nearly 94% of ACs in Kolkata are 1.5 TR or smaller, while only 6% are above 2 TR. This is in line with the national trend, where 93% are 1.5 TR or less.

3. **Kolkata households keep ACs at higher temperatures:** About 79% of household owning AC, set their ACs at 23°C or above, well above the national average of 67%. Nearly half (49%) set the temperature between 23–24°C, like the national share of 47%. On average, households in Kolkata use ACs for 4 hours per day, slightly higher than the national average of 3.9 hours.

4. **Highest adoption of 5-star rated ACs:** Kolkata leads all surveyed cities with 42% of households owning 5-star rated units, compared to 28% nationally. About 53% own 3-star units, slightly below the 60% national average.

5. **More complaints on AC issues not resolved than unnecessary refrigerant refilling:** In Kolkata, 60% of service complaints are about problems not being resolved, while 40% are about unnecessary refrigerant refilling. Nationally, the pattern is reversed, 32% complaints are unresolved issues, while 68% are about unnecessary refrigerant refilling.

6. **High refrigerant refill rate per AC:** In Kolkata, 42% ACs refill refrigerant every year, similar to national refrigerant refill rate of 41%.

7. **Refilling costs are lower in Kolkata:** The average refrigerant refilling cost is ₹1,600 per AC, compared to the national average of ₹2,200.

8. **Stronger preference for company technicians:** In Kolkata, 63% of households prefer company technicians for servicing, while 34% rely on local technicians. Nationally, 43% prefer local technicians.

9. **Lowest awareness of low-GWP refrigerants:** About 69% of households in Kolkata are unaware of natural or low-GWP refrigerants—the highest level of unawareness among all surveyed cities.

Key Takeaways for Chennai:

1. **Most households own just one AC:** In Chennai, 77% of households own just one AC, while 23% own more than two. Nationally, 87% of households own one AC, and 13% own more than two.

2. **1.5 tonne AC is the standard:** In Chennai, 95% of ACs are 1.5 TR or less, while only 5% are above 2 TR capacity. Nationally, 93% of ACs are 1.5 TR or less, and 7% are more than 2 TR.

3. **AC temperature settings show variation:** Nearly 60% of households in Chennai set their ACs at 23–25°C, while 40% set it below 23°C. Nationally, about 67% of households set their AC above 23°C.

4. **Energy efficiency is high:** Nearly 99% of households in Chennai have 3-star to 5-star rated units, slightly higher than the national share of 98%.

5. **Chennai leads in AC usage:** Households in Chennai use ACs for an average of 4.4 hours per day, compared to 3.9 hours nationally—the highest daily usage among surveyed cities.

6. **High refrigerant refill rate: I**n Chennai, little more than half of ACs refill refrigerant every year, which is the highest rate and far exceeds the national refrigerant refill rate of 41%.

7. **Servicing is dominated by unnecessary refilling:** In Chennai, 73% of service complaints are about unnecessary refrigerant refilling, while 27% are about unresolved problems. Nationally, 68% of complaints are about refilling, and 32% about unresolved issues.

8. **Refilling is more expensive:** The cost of refrigerant refilling in Chennai is ₹2,300 per AC—the highest among all surveyed cities and above the national average of ₹2,200.

9. **Awareness of climate-friendly refrigerants is low:** In Chennai, 64% of households owning ACs are unaware of environmentally friendly refrigerants, compared to 43% nationally. Only 16% showed willingness to switch to climate-friendly refrigerant-based ACs if affordable—the lowest among all surveyed cities.

10. **Local technicians dominate servicing:** In Chennai, 54% of households prefer local technicians for AC servicing, while 46% prefer company technicians. Nationally, the share for local technicians is lower at 43%.

Key Takeaways for Ahmedabad:

1. **Single AC ownership dominates:** Among AC owning households in Ahmedabad, 95% has just one AC (like Mumbai at 96%, and Delhi at 94%), while 5% own more than two. Nationally, 87% owns one AC, and 13% own more than two.

2**. Larger capacity ACs more common in Ahmedabad:** 14% of ACs in Ahmedabad are more than 2 TR capacity- higher than other cities- and as compared to 7% at national level. The remaining 86% Ahmedabad households own 1.5 TR or lesser capacity – nationally it is 93%.

3. **Higher thermostat settings:** Nearly 43% of households in Ahmedabad set their ACs at 25°C and above, more than double the national average of 20%.

4**. Energy efficiency awareness in Ahmedabad:** Nearly 95% of households owning ACs have 3-star to 5-star rated units, compared to 98% at national-level.

5. **Slightly lower usage:** In Ahmedabad, households use ACs for an average of 3.8 hours per day - nearly same to that of national level at 3.9 hours.

6**.Price- as preference for buying AC- matters least in Ahmedabad:** 38% of households in Ahmedabad consider Price the least important factor, compared to 16% nationally. Brand is the first preference for Ahmedabad household at- 45% as compared to 56% nationally.

7**. AC servicing complaints are high:** In Ahmedabad, 64% of service complaints are about problems not being resolved, while 26% are about unnecessary refrigerant refilling. Nationally, 32% of complaints are about problems not being resolved, and 68% about unnecessary refilling.

8**. Moderate refrigerant refill rates:** In Ahmedabad, one fourth of ACs refill refrigerant every year, which is the lowest rate among all cities and well below the national refrigerant refill rate of 41%.

9. **Lowest refill costs:** The cost of refrigerant refilling per AC in Ahmedabad is ₹1,200, the lowest nationally and nearly half of the national average of ₹2,200.

10.**Local technicians dominate:** 63% of households in Ahmedabad prefer local technicians for servicing, while 36% prefer company technicians. Nationally, 44% prefer local technicians.

Key Takeaways for Pune:

1. **Single AC ownership dominates Pune:** 83% of household owning AC have one AC, lower than Mumbai, Delhi, and Ahmedabad (90%+). About 16% own more than two, above the national average of 13%.

2. **1.5 TR ACs dominate:** Around 93% of household owning AC have 1.5 TR or smaller ACs, the same as the national trend.

3. **Pune leads in 4-star rated ACs:** 99% of household owning AC have 3–5-star units; 20% own 4-star models, the highest among cities surveyed, compared to 9% nationally.

4. **Lower usage hours in Pune:** Daily AC usage in Pune is 3.6 hours per day, slightly lower than the national average of 3.9 hours.

5. **High refrigerant refilling complaints:** In Pune, 81% of service complaints are about unnecessary refrigerant refilling, significantly higher than the national average of 68%. Only 19% of complaints are about unresolved problems.

6. **High refrigerant refill rate:** In Pune, around 39% ACs refill refrigerant every year, a rate similar to national refrigerant refill rate of 41%.

7. **Refilling costs higher in Pune:** The average refrigerant refilling cost in Pune is ₹2,300 per AC, higher than the national average of ₹2,000, and considerably above cities like Ahmedabad (₹1,200) and Kolkata (₹1,600).

8. **Strong preference for climate-friendly refrigerants:** About 51% of Pune households are ready to adopt ACs with climate-friendly refrigerants, far higher than the national average of 30%.

9. **Greater reliance on company technicians:** In Pune, 67% of households prefer company technicians for servicing, while 33% opt for local technicians. Nationally, the share of local technicians is higher at 43%.

10. **Lower temperature settings more common:** In Pune, 15% of households set their ACs below 20°C, higher than the national average of 9%. However, only 48% prefer 23°C and above, much lower than Ahmedabad and Kolkata (80%) and below the national average of 67%.

Key Takeaways for Jaipur:

1. **AC ownership of one AC unit:** In Jaipur, 82% of AC-owning households have just one AC, close to the national average of 87%. About 5% own more than two ACs—the highest share among all surveyed cities.

2. **1.5 tonne AC is dominant capacity in Jaipur:** Around 81% of AC-owning households in Jaipur use 1.5 TR ACs, well above the national average of 74%.

3. **Households prefer cooler AC temperature:** Nearly 59% of Jaipur households set their AC between 23–24°C, far above the national average of 47%.

4. **High priority for energy efficiency:** About 31% of Jaipur households own 5-star rated ACs, higher than the national average of 28% and well above Ahmedabad (21%), Delhi (24%), and Chennai (21%).

5. **Daily usage is in line with national trends:** Jaipur households run their ACs for an average of 3.5 hours per day, comparable to the national average of 3.9 hours.

6. **Moderate refrigerant refilling rates:** Two third ACs in Jaipur require annual refrigerant refilling, similar to national refrigerant refill rate of 41%.

7. **Refilling costs are the highest in the country:** At ₹2,400 per refill, Jaipur faces the steepest refrigerant refilling costs—almost double that of Ahmedabad (₹1,200) and much higher than Kolkata (₹1,600).

8. **Unnecessary refrigerant refilling as AC service complaints is dominant:** In Jaipur, 22% of service complaints remain unresolved, while 88% relate to unnecessary refrigerant refilling—much higher than the national average of 68%, and the highest among all surveyed cities.

9. **Strong reliance on company technicians:** Only 31% of households in Jaipur prefer local technicians, compared to 44% nationally. With 69% depending on company technicians, Jaipur has the lowest preference for local servicing.