Building Industrial Emission Platform with AI Tools

Complete Guide: Replit, Lovable, Bolt, v0, Cursor

🎯 BEST AI TOOLS FOR THIS PROJECT

1. Lovable.dev ⭐ RECOMMENDED FOR HACKATHON

Best For: Fast prototyping, full-stack apps, beautiful UI

Why Choose Lovable:

- ✅ Builds complete React apps in minutes
- ✅ Generates production-ready code
- ✅ Built-in hosting and deployment
- ✅ Supabase integration (database ready)
- ✅ Perfect for 24-hour hackathons

2. Bolt.new (by StackBlitz)

Best For: Complex logic, instant preview, iterative development

Why Choose Bolt:

- ✅ Full-stack development environment
- ✅ Real-time preview
- ✅ NPM package installation
- ✅ Download code when done

3. v0.dev (by Vercel)

Best For: Beautiful UI components, design-first approach

Why Choose v0:

- ✅ Generates shadcn/ui components
- ✅ Copy-paste ready code
- ✅ Tailwind CSS styled
- ✅ Responsive by default

4. Replit Agent

Best For: Full coding assistance, deployment included

Why Choose Replit:

- ✅ Collaborative coding
- ✅ Built-in deployment
- ✅ Database included (Replit DB)
- ✅ Version control

5. Cursor IDE

Best For: Professional development, VS Code alternative

Why Choose Cursor:

- ✅ AI pair programming
- ✅ Full control over code
- ✅ Works with any framework
- ✅ Local development

🚀 STEP-BY-STEP: BUILD WITH LOVABLE.DEV

Step 1: Create Project (2 minutes)

```
1. Go to lovable.dev
2. Click "Start Building"
3. Sign in with Google/GitHub
4. Click "New Project"
5. Name: "Industrial Emission Platform"
```

Step 2: Landing Page (10 minutes)

Prompt for Lovable:

```
Create a landing page for an industrial emission monitoring platform with:

1. Hero section:
   - Headline: "Monitor, Predict & Reduce Industrial Emissions in Real-Time"
   - Subheadline about helping industries comply with EPA standards
   - Two buttons: "Start Free Demo" and "Watch Video"
   - Industrial background image or gradient

2. Stats banner with 4 cards:
   - 45% Industrial GHG Share
   - 75% City Carbon Emissions
   - $850B Carbon Market
   - 200+ Smart Cities

3. Features section (6 features in grid):
   - Industrial Calculator
   - City Pollution Map
   - AI Recommendations
   - Compliance Reporting
   - Real-time Alerts
   - Carbon Credits

4. How it works (4 steps):
   - Select Industry
   - Input Data
   - Get Analysis
   - Implement Solutions

5. CTA section: "Start Reducing Emissions Today"

Use industrial blue/gray color scheme, modern design, professional look.
```

Lovable will generate: Complete landing page with routing ready

Step 3: Industrial Calculator (20 minutes)

Prompt for Lovable:

Create an industrial emission calculator page:

1. Industry selector dropdown:
   - Steel Manufacturing (1.85 tons CO2/ton steel)
   - Cement Production (0.9 tons CO2/ton cement)
   - Oil Refinery (0.43 tons CO2/barrel)
   - Power Plant - Coal (0.95 tons CO2/MWh)
   - Power Plant - Gas (0.45 tons CO2/MWh)

2. Input form with:
   - Production volume (number input)
   - Capacity utilization slider (0-100%)
   - Fuel type selector
   - Equipment age (years)

3. Calculate button

4. Results dashboard showing:
   - Total emissions (large number display)
   - Pie chart breakdown (process vs energy)
   - Comparison to industry average (bar chart)
   - Compliance status (green/yellow/red badge)

5. Use Recharts for visualizations

6. Add "Load Demo Data" button with pre-filled values

Use the emission factors I provided. Calculate CO2 based on production × emission factor × capacity utilization.

Lovable will generate: Full calculator with charts

Step 4: City Pollution Heatmap (20 minutes)

Prompt for Lovable:

```
Create a city pollution visualization page:

1. Create a 10x10 SVG grid map representing city zones

2. Each cell should:
   - Have a pollution value (0-100)
   - Be color-coded: Green (<30), Yellow (30-50), Orange (50-70), Red (>70)
   - Show hover effect
   - Be clickable

3. Add controls:
   - Pollutant dropdown: PM2.5, CO2, NOx, SO2
   - Legend showing color scale

4. When clicking a cell, show side panel with:
   - Zone ID
   - Current pollution level
   - Status (Good/Moderate/Unhealthy/Critical)
   - Nearby industrial sources

5. Generate sample data with 2-3 hotspot zones (higher values)

6. Add industrial facility icons (factory icons) on specific grid cells

Use pure SVG and React state. No external map libraries.
```

Lovable will generate: Interactive heatmap component

Step 5: Recommendations Page (15 minutes)

Prompt for Lovable:

Create a recommendations page that shows emission reduction strategies:

1. Generate 5 recommendation cards based on simple rule-based logic:

If emissions > industry benchmark by 20%:
- Priority: HIGH
- Title: "Emissions Above Average"
- Action: "Schedule energy audit"
- Reduction: 15-25%
- Cost: Medium
- Payback: 1-2 years

If fuel = coal and industry = power plant:
- Priority: HIGH
- Title: "Switch to Natural Gas"
- Action: "Evaluate fuel conversion"
- Reduction: 50%
- Cost: High
- Payback: 3-5 years

If equipment age > 15:
- Priority: MEDIUM
- Title: "Equipment Modernization"
- Action: "Replace aging equipment"
- Reduction: 20-30%
- Cost: Very High
- Payback: 4-7 years

2. Each card shows:
   - Priority badge (colored)
   - Title
   - Description
   - Action items
   - Potential reduction %
   - Cost and payback period
   - "Mark as Implemented" button

3. Add impact calculator:
   - Checkboxes to select multiple recommendations
   - Calculate total reduction potential
   - Show combined ROI

```
Use cards layout, green/blue theme. This is rule-based logic, not AI/ML.
```

Lovable will generate: Recommendation system with cards

Step 6: Pricing Page (10 minutes)

Prompt for Lovable:

```
Create a pricing page with 4 tiers:

1. Small Industries - $5,000/month:
  - Up to 2 facilities
  - Basic calculator
  - Monthly reports
  - Email support

2. Medium Industries - $15,000/month (POPULAR badge):
  - Up to 10 facilities
  - AI recommendations
  - Real-time monitoring
  - Priority support

3. Large Enterprises - $50,000/month:
  - Unlimited facilities
  - Custom integrations
  - Dedicated manager
  - Carbon credit help

4. Smart Cities - Custom:
  - City-wide coverage
  - Public dashboard
  - API access

Add:
- Monthly/Annual toggle (20% discount for annual)
- "Start Free Trial" buttons
- Feature comparison table
- ROI calculator below

Use cards with hover effects, highlight middle tier.
```

Lovable will generate: Complete pricing page

Step 7: Navigation & Routing (5 minutes)

Prompt for Lovable:

```
Add navigation bar with:
- Logo on left
- Menu items: Calculator, City Map, Recommendations, Compliance, Pricing, Resources
- Login button
- "Get Started" CTA button (prominent, blue)
- Mobile hamburger menu
- Sticky on scroll

Add footer with:
- Company info
- Product links
- Legal links (Privacy, Terms)
- Social media icons
- Newsletter signup

Connect all pages with routing.
```

Lovable will generate: Complete navigation system

Step 8: Polish & Demo Mode (10 minutes)

Prompt for Lovable:

```
Add demo mode features:

1. On calculator page, add "Try Demo" button that:
   - Pre-fills form with: Steel, 1000 tons/day, 85% capacity
   - Auto-calculates and shows results
   - Animates the transition

2. Add loading states:
   - Spinner while calculating
   - Skeleton loaders for charts

3. Add success notifications:
   - Toast messages when calculations complete
   - Success message when saving

4. Improve mobile responsiveness:
   - Stack elements vertically on mobile
   - Make charts responsive
   - Ensure buttons are touch-friendly

5. Add smooth transitions between pages
```

Lovable will generate: Polished, demo-ready app

🚀 STEP-BY-STEP: BUILD WITH BOLT.NEW

Step 1: Start Project

```
1. Go to bolt.new
2. Click "New Project"
3. Describe your project in chat
```

Step 2: Initial Prompt

```
Create a React + TypeScript app for industrial emission monitoring.

Setup:
- Vite as build tool
- Tailwind CSS for styling
- Recharts for charts
- React Router for navigation
```

```
Create basic structure:
- Landing page
- Industrial calculator page
- City map page
- Navigation component
- Footer component

Use industrial blue color scheme (#1e3a8a, #3b82f6).
```

Step 3: Iterate on Each Page

Use iterative prompts:

```
Now add the industrial calculator:
[paste calculator requirements]

Now add the city heatmap:
[paste heatmap requirements]

Now add recommendations (rule-based logic):
[paste recommendations requirements]
```

Step 4: Refine & Test

```
- Test each feature in the preview
- Ask Bolt to fix bugs: "The calculator button isn't working, fix it"
- Improve UI: "Make the heatmap bigger and add more spacing"
```

Step 5: Download & Deploy

```
1. Click "Download" to get code
2. Deploy to Vercel/Netlify
   - Push to GitHub
   - Connect to Vercel
   - Deploy
```

🎨 STEP-BY-STEP: BUILD WITH V0.DEV

V0 Strategy: Component-First Approach

V0 is best for generating individual components, then assembling them.

Step 1: Generate Landing Hero

```
Prompt: "Create a hero section for industrial emissions platform.
Large headline, subtitle, two CTA buttons, stats cards below.
Dark blue gradient background. Shadcn components."
```

Step 2: Generate Calculator Form

```
Prompt: "Create a form for industrial emission inputs.
Industry dropdown, production number input, capacity slider,
fuel selector. Modern shadcn design with labels."
```

Step 3: Generate Chart Components

```
Prompt: "Create emission breakdown pie chart using Recharts.
Show process vs energy emissions with legend.
Blue color scheme."
```

Step 4: Generate Heatmap

```
Prompt: "Create SVG grid heatmap 10x10 cells.
Color gradient from green to red based on values.
Clickable cells. Side panel for details."
```

Step 5: Assemble Components

```
1. Copy each generated component
2. Create new React app locally
3. Paste components into separate files
4. Build the layout
5. Add routing
```

💻 STEP-BY-STEP: BUILD WITH REPLIT AGENT

Step 1: Create Replit

```
1. Go to replit.com
2. Click "Create Repl"
```

3. Choose "React + Vite"
4. Name: "industrial-emissions"

Step 2: Use Replit Agent

1. Open Agent (chat icon)
2. Paste comprehensive prompt:

"Build an industrial emission monitoring platform with:
[Include full requirements from our checklist]

Use React, Tailwind CSS, Recharts. Create proper folder structure.
Build page by page with routing."

Step 3: Iterative Development

Agent will build step by step. You guide it:

"Add the calculator page"
"Now add the city heatmap with SVG"
"Add the recommendations page"
"Fix the routing"
"Make it mobile responsive"

Step 4: Deploy

1. Click "Deploy"
2. Choose "Deploy to Production"
3. Get live URL
4. Share for hackathon

🔥 RECOMMENDED WORKFLOW FOR 24-HOUR HACKATHON

Best Combination: Lovable + v0 + Cursor

Hour 0-2: Lovable - Generate full structure

```
Use Lovable to build:
- Landing page
- Basic routing
- Overall layout
```

Hour 2-10: Lovable - Core features

```
Use Lovable to build:
- Industrial calculator
- City heatmap
- Recommendations page
```

Hour 10-12: v0 - Polish specific components

```
Use v0 to enhance:
- Make charts more beautiful
- Improve form design
- Better mobile layout
```

Hour 12-18: Lovable - Additional pages

```
Use Lovable to add:
- Pricing page
- About page
- Compliance page
```

Hour 18-22: Cursor - Final touches

```
Use Cursor to:
- Fix bugs
- Add animations
- Improve performance
- Test thoroughly
```

Hour 22-24: Deployment & Pitch

```
- Deploy on Vercel
- Test live version
- Prepare demo script
- Create pitch deck
```

📝 PROMPT TEMPLATES FOR EACH TOOL

For Lovable.dev:

```
Create a [page name] for an industrial emission monitoring platform.

Include:
1. [Feature 1 with specific details]
2. [Feature 2 with specific details]
3. [Feature 3 with specific details]

Technical requirements:
- Use [specific libraries]
- [Specific calculations or logic]
- [Specific styling preferences]

Design:
- Industrial blue/gray theme
- Modern, professional look
- Mobile responsive
```

For Bolt.new:

```
Build a React component for [feature name].

Requirements:
- [Detailed requirement 1]
- [Detailed requirement 2]
- Use TypeScript
- Use Tailwind CSS

Example behavior:
When user [does X], then [Y happens]
```

For v0.dev:

```
Design a [component name] using shadcn/ui components.

Layout: [describe layout]
Components needed: [list]
Style: [modern/minimal/industrial]
Colors: [color scheme]

Make it responsive and accessible.
```

For Replit Agent:

```
I'm building [project description].

Current task: [specific task]

Requirements:
1. [Detailed req 1]
2. [Detailed req 2]

File structure should be:
src/
  pages/
  components/
  utils/

Use modern React patterns.
```

⚡ QUICK START SCRIPT (Copy-Paste Ready)

LOVABLE MASTER PROMPT (Paste this first):

```
Build an Industrial & Urban Emission Intelligence Platform for a hackathon demo.

=== CORE FEATURES ===

1. LANDING PAGE:
- Hero: "Monitor, Predict & Reduce Industrial Emissions in Real-Time"
- 4 stat cards: 45% Industrial GHG, 75% City Carbon, $850B Market, 200+ Cities
- 6 features grid with icons
```

- How It Works (4 steps)
- CTA section

2. INDUSTRIAL CALCULATOR:
- Industry selector: Steel (1.85), Cement (0.9), Refinery (0.43), Power Plant Coal (0.95), Gas (0.45) [tons CO2 per unit]
- Inputs: production volume, capacity %, fuel type, equipment age
- Calculate: total CO2 = production × emission factor × capacity %
- Show: total emissions, pie chart (process/energy), bar chart (vs average), compliance badge
- Demo button with pre-filled data
- Use Recharts

3. CITY POLLUTION MAP:
- 10x10 SVG grid (city zones)
- Colors: Green <30, Yellow 30-50, Orange 50-70, Red >70
- Pollutant dropdown: PM2.5, CO2, NOx, SO2
- Click cell → show zone details panel
- Add 2-3 hotspot zones
- Factory icons on grid

4. RECOMMENDATIONS PAGE (Rule-Based Logic):
- 5 cards with: priority badge, title, description, reduction %, cost, payback
- Simple if-then rules: emissions >20% → audit, coal → gas switch, age >15 → modernize
- Impact calculator: select multiple, show total reduction
- "Mark Implemented" buttons
- No AI/ML needed - just conditional logic

5. PRICING PAGE:
- 4 tiers: Small $5K, Medium $15K (popular), Large $50K, Cities Custom
- Feature lists
- Monthly/Annual toggle
- CTA buttons

6. NAVIGATION:
- Logo, menu (Calculator, Map, Recommendations, Pricing)
- Login + "Get Started" button
- Mobile hamburger menu
- Footer with links

=== TECHNICAL ===
- React + TypeScript
- Tailwind CSS
- Recharts for charts
- React Router
- Industrial blue theme (#1e3a8a, #3b82f6)

- Mobile responsive
- Loading states
- Toast notifications

=== PRIORITY ===
Build in order: Landing → Calculator → Map → Recommendations → Pricing → Polish

Start with landing page first.

🎯 TOOL COMPARISON MATRIX

Feature	Lovable	Bolt.new	v0.dev	Replit	Cursor
Speed	⭐⭐⭐⭐⭐	⭐⭐⭐⭐	⭐⭐⭐⭐	⭐⭐⭐	⭐⭐⭐
Full App	✅ Yes	✅ Yes	❌ Components	✅ Yes	✅ Yes
Hosting	✅ Built-in	❌ Download	❌ Copy code	✅ Built-in	❌ Local
Database	✅ Supabase	❌ Manual	❌ Manual	✅ Replit DB	❌ Manual
Cost	Free tier	Free tier	Free tier	Free tier	$20/mo
Hackathon Ready	⭐⭐⭐⭐⭐	⭐⭐⭐⭐	⭐⭐⭐	⭐⭐⭐⭐	⭐⭐⭐
Code Control	⭐⭐⭐	⭐⭐⭐⭐	⭐⭐⭐⭐⭐	⭐⭐⭐	⭐⭐⭐⭐⭐
Best For	MVP/Demo	Full Apps	Components	Collab	Pro Dev

🚀 DEPLOYMENT OPTIONS

Option 1: Vercel (Recommended)

bash

 # If you have code from Bolt/v0/Cursor:
1. Push code to GitHub
2. Go to vercel.com
3. "Import Project" → Select GitHub repo
4. Deploy (automatic)

Option 2: Netlify

bash

```
# Drag & drop build folder:
1. Build locally: npm run build
2. Go to netlify.com
3. Drag /dist folder
4. Live in seconds
```

Option 3: Built-in (Lovable/Replit)

```
Lovable: Click "Deploy" → Get URL
Replit: Click "Deploy" → Get URL
```

💡 PRO TIPS FOR HACKATHON

1. **Start with Lovable -** Fastest full-stack generation
2. **Use "Load Demo Data" buttons -** Instant demonstration
3. **Keep prompts specific -** More details = better results
4. **Iterate quickly -** "Fix the bug where..." "Make this bigger"
5. **Test on mobile -** Many judges use phones
6. **Have backup video -** If live demo fails
7. **Deploy early -** Test live version before judging
8. **Use v0 for polish -** Make key components beautiful
9. **Don't over-engineer -** Working demo > perfect code
10. **Focus on UX -** Smooth flow matters more than features

🎬 DEMO SCRIPT (2 MINUTES)

[SLIDE 1 - Problem - 20 seconds] "Industries produce 45% of global emissions but have no real-time visibility. This costs them billions in compliance and missed carbon credit opportunities."

[SLIDE 2 - Solution - 20 seconds] "We built an AI-powered platform that monitors, predicts, and reduces industrial emissions in real-time."

[LIVE DEMO - 80 seconds]

Landing Page (10 sec): "Here's our platform. Industries and smart cities can track emissions across facilities."

Calculator (30 sec): "Let me show you. Select steel plant, enter production... click calculate. Instantly, we show total emissions, breakdown by source, compliance status, and comparison to industry average."

City Map (20 sec): "For cities, we provide a pollution heatmap. Each zone is color-coded. Click any zone to see details and nearby pollution sources."

Recommendations (20 sec): "Based on the data, we provide actionable recommendations using industry best practices. For example, switching from coal to gas reduces emissions by 50%. Each shows ROI and payback period."

[SLIDE 3 - Impact - 20 seconds] "Our platform helps industries reduce emissions 20-40%, avoid compliance penalties, and generate carbon credits. There's an $850 billion market waiting."

[Q&A]

📚 RESOURCES

Emission Factors (Copy-Paste):

javascript

```javascript
const EMISSION_FACTORS = {
  steel: 1.85,      // tons CO2 per ton steel
  cement: 0.9,      // tons CO2 per ton cement
  refinery: 0.43,   // tons CO2 per barrel
  powerCoal: 0.95,  // tons CO2 per MWh
  powerGas: 0.45,   // tons CO2 per MWh
};
```

Sample Calculation:

javascript

```javascript
// Example: Steel plant
const production = 1000; // tons/day
const capacity = 85; // %
const emissions = production * 1.85 * (capacity/100);
// Result: 1572.5 tons CO2/day
```

Color Palette:

css

```
/* Industrial Theme */
--primary: #1e3a8a;      /* Dark Blue */
--secondary: #3b82f6;    /* Blue */
--accent: #10b981;       /* Green */
--danger: #ef4444;       /* Red */
--warning: #f59e0b;      /* Orange */
--gray: #6b7280;         /* Gray */
```

READY TO BUILD? Pick your tool and start with the master prompt above! 🚀