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Paper Titled:
SUSTAINABLE ISSUES IN LOW-MIDDLE INCOME APARTMENTS IN URBAN AMMAN/JORDAN: HEATING DEVICES AND HEALTH CONCERNS

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OUTLINE

1. Introduction
2. Research Problems
3. Objectives
4. Methodology
5. Results & Discussions
6. Conclusion & Recommendation
1. INTRODUCTION

- Jordan is a developing country located in the Northern side of Arabian Peninsula.
2. RESEARCH PROBLEMS

- **Energy** in Jordan is a ‘**CHRONIC**’ problem.

- **Energy security** is a major challenge for sustainable development...(1)

- **Around 61%** of energy consumed by residential stock in Jordan is used for heating spaces...(2)

- **Combustion of such fuels** generates poor indoor quality...(3)

- **Around 53%** of households (mainly urban) suffer from dampness/fungi areas, most likely in poorly ventilated houses...(4)

- **GHG emissions** produced by housing stock in Jordan are anticipated to increase by **59%** by 2018...(5)
3. OBJECTIVES

• To investigate types of furnaces used by low-middle income households in Amman

• To discuss their health implications.

• To explore construction configurations of low-middle income apartments.

• To recommend potentially resilient solutions against challenges, if any.
4. METHODOLOGY

- A sample of 106 low-middle income apartments were surveyed in urban Amman.

- Semi-structured interviews have been conducted.
5. RESULTS & DISCUSSIONS

Low-middle income classes

Kerosene & LPG are dominant, with 65% using more than 1 device.

Low-middle income classes use various devices for heating spaces, with Kerosene and LPG being the most prevalent.
5. RESULTS & DISCUSSIONS

Construction Types of Surveyed Apartments’ Envelopes

Around 75% of Surveyed Apartments' Envelope is Dominantly Cement Hollow Bricks, Type C
5. RESULTS & DISCUSSIONS

Cement Hollow Bricks

**U-Value:** 2.38 W/m²K
5. RESULTS & DISCUSSIONS

The conducted interviews revealed different concerns:

- Fungi Areas
- Coldness
- 50% reported Health problems
- Trials to adapt
6. CONCLUSION & RECOMMENDATION

- **K**erosene & LPG heaters are the dominant.
- **L**ow-middle income apartments in the capital are thermally ineffectual.
- **H**ealth implications reported by inhabitants.

**T**hrift retrofit measures are urgently needed for those apartments to alleviate fuel poverty, enhance human thermal comfort & reduce carbon emissions.

Informed the ongoing work of the Research
Samples of Surveyed Apartments
THANK YOU
(Q & A)