

Fuel poverty in mainland France

*How has COVID-19 influenced
the dynamics of fuel poverty?*

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Understanding the dynamics of fuel poverty

How:

- ▶ Calculate the probability of moving from a situation (or state) of fuel poverty to a state of non-fuel poverty or vice versa
- ▶ Calculate the probability of remaining in the same state.

Is there a fuel poverty trap?

2009-2011: Fuel poverty was not a permanent state ([Chaton and Lacroix, 2018](#))

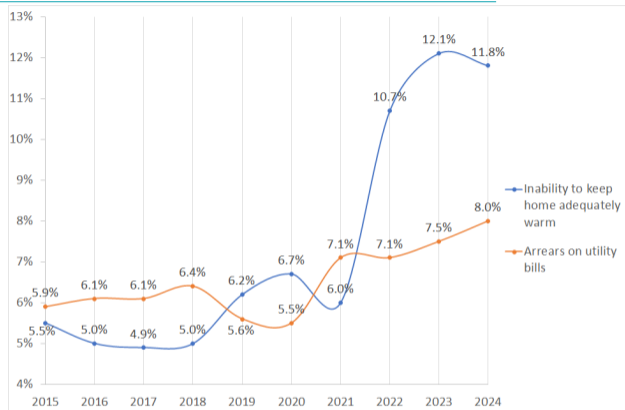
Is this still the case?

Has COVID-19 made the situation worse?

French context (2024)

2024: 11.8% of households were unable to heat their homes adequately (Eurostat)

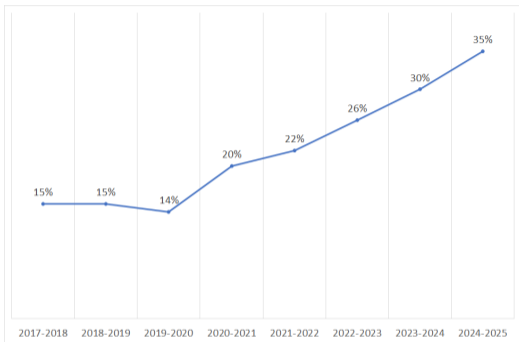
- ▶ Living in energy-inefficient housing
- ▶ Having a low income and/or
- ▶ Paying high energy prices



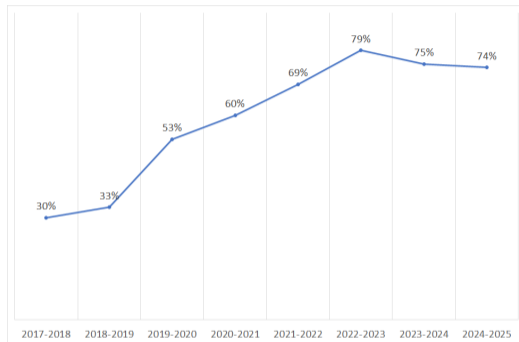
Source: Eurostat

Inability to heat one's home adequately: the first definition of fuel poverty (Bradshaw and Hutton, 1983)

French context (2025)



People reporting feeling cold in their homes
Le médiateur national de l'énergie, 2023 – National Energy Ombudsman



People who limit their heating

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Statistics on Resources and Living Conditions (SRCV) survey

2017 – 2021 waves of SRCV

- ▶ Part of the European EU-SILC (European Union - Community Statistics on Income and Living Conditions) plan
- ▶ Data on income, financial situation, living conditions of households + housing characteristics and housing expenditure
- ▶ Households respond to the survey for at least **3 consecutive years** ⇒ A longitudinal analysis of transitions between different states of fuel poverty.

2017	2018	2019	2020	2021	2022	2023
11,068	10,876	11,737	10,899	14,015	17,451	17,041

Number of observations

Fuel poverty indicator

based on two questions:

- ▶ Do you have the financial means to keep your home at a comfortable temperature? (variable TEMP)
 - ▶ Yes
 - ▶ No
- ▶ Currently, would you say that financially (variable NIVACTB):
 1. You cannot manage without getting into debt (**Very difficult**)
 2. You can barely manage (**Difficult**)
 3. It's okay, but you have to be careful (**Quite difficult**)
 4. It's fine (**Quite easy**)
 5. You are fairly comfortable (**Easy**)
 6. You are really comfortable (**Very easy**)

Three states

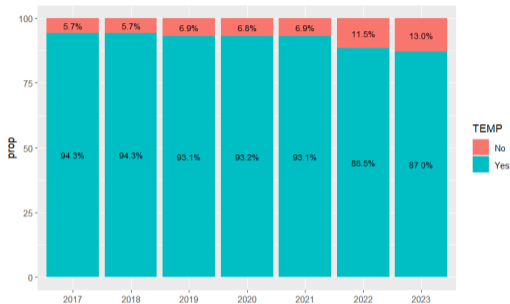
		Households' perception of their current financial situation					
		Very dif.	Dif.	Quite dif.	Very easy	Easy	Quite easy
TEMP	Yes	FP	FP	NFP	NFP	NFP	NFP
	No	SFP	SFP	FP	FP	NFP	NFP

Note: Dif. = Difficult; NFP = non-fuel poverty state ; FP = fuel poverty state; SFP = severe fuel poverty state; TEMP : Financial resources to maintain the house at a comfortable temperature

Distribution of individuals within states in 2017, 2019 and 2023

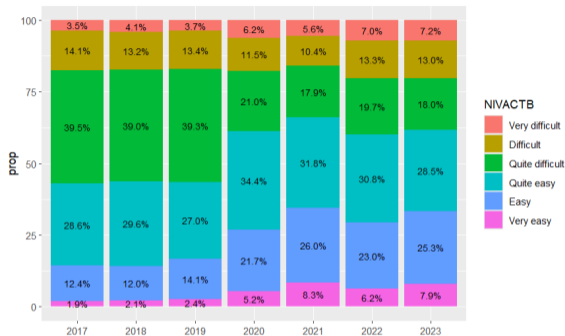
		Entire population			NFP			FP			SFP		
		2017	2019	2023	2017	2019	2023	2017	2019	2023	2017	2019	2023
Location (population density)	Rural	22.6	21.2	20.5	24.7	22.8	22.1	21.8	18.3	20.4	18.5	18.4	21.7
	Urban	77.4	78.8	79.5	75.3	77.2	77.7	78.2	81.7	79.4	81.5	81.6	78.2
Marital status	Single	35.7	38.2	38.8	33.6	35.7	38.5	38.0	43.3	38.4	54.6	50.9	42.7
	Single-parent families	8.6	8.9	8.9	6.7	7.1	6.3	17.9	17.3	14.9	11.7	20.8	22.9
	2 adults without dep. child	26.8	27.6	25.4	30.5	29.9	29.9	13.6	13.4	16.8	12.9	11.0	13.0
	Two-adult family with children	26.6	27.3	24.1	27.3	26.2	23.0	28.1	24.5	26.7	19.0	15.2	16.9
	Others	2.3	2.3	2.7	2.0	1.1	2.3	2.4	1.5	3.3	1.8	2.1	4.5
Housing type	House	61.7	60.2	59.7	66.7	64.5	63.3	53.8	49.0	51.2	54.4	52.7	53.1
	Apartment	38.0	39.6	40.1	33.3	35.5	36.7	46.2	51.0	48.8	45.6	47.3	46.9
Occupancy status	Owner	60.9	60.6	60.2	72.1	68.7	69.0	45.6	39.2	41.6	36.7	34.6	31.8
	Tenant	39.1	39.4	39.8	27.9	31.3	31.0	54.4	60.8	58.4	63.3	65.4	68.2

Increasing difficulties



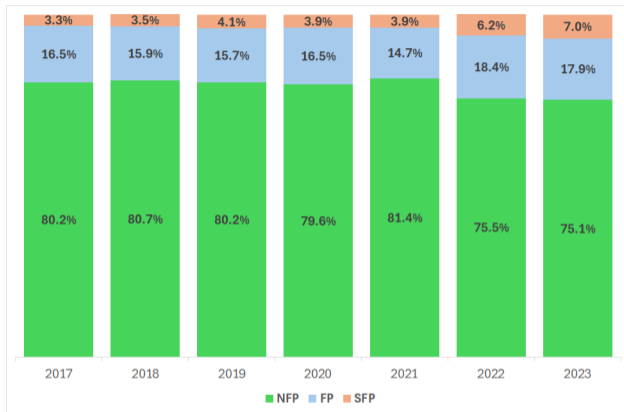
Financial resources to maintain the house at a comfortable temperature

Source: SRCV



Households' perception of their current financial situation

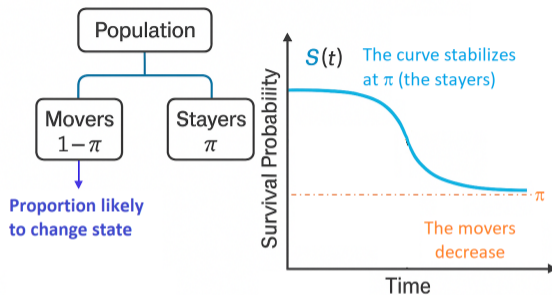
Increase in fuel poverty



NFP = non-fuel poverty state ; FP = fuel poverty state ; SFP = severe fuel poverty state
Source: SRCV

Autumn 2021: the French government has introduced measures to protect French households and their purchasing power against rising energy prices

Mover-stayer model



$$S(t) = \pi + (1 - \pi)S_m(t)$$

- ▶ Developed in the biomedical field (Boag, 1949) = cure model.
- ▶ Labour market (Blumen et al., 1955; Dunsmuir et al. 1989; Fougère and Kamionka, 1992)
- ▶ To model criminal recidivism (Schmidt and Witte 1989)

First application to the dynamics of fuel poverty (Chaton and Lacroix, 2018)

Another indicator of fuel poverty

- ▶ DIFCHAUF: “Is it too difficult or too expensive to heat your home properly?” → NIVACTB
- ▶ DIFCHAUF no longer exists since 2020

A mover-stayer model

- ▶ The Mover-Stayer model: an extension of the Markov chain model. It is a discrete-time process with a discrete state space.
- ▶ The proportion of stayers in each state and the transition probabilities matrix between states for the movers, are estimated via maximum likelihood methods.

2017–19	2018–20	2019–21	2020–22	2021–23
6,472	2,643	3,555	6,207	7,376

Number of individuals included in the study

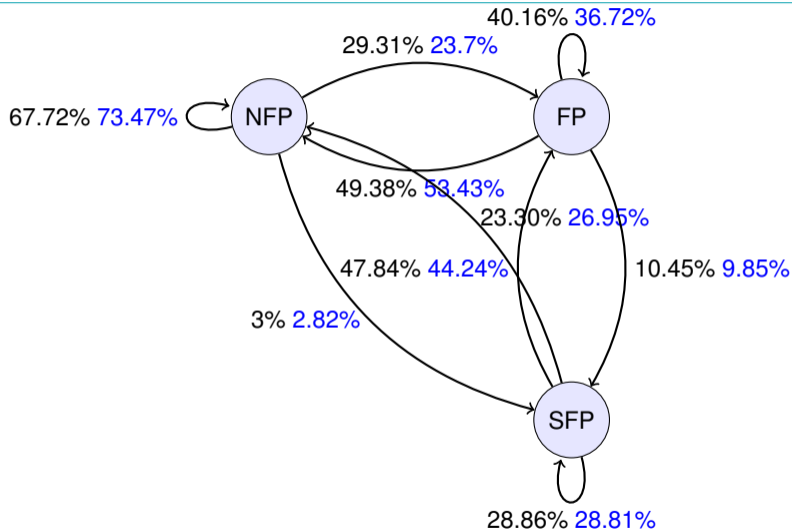
Estimated proportion of 'stayers'

	All households			Single-parent families		
	NFP	FP	SFP	NFP	FP	SFP
2017–2019	76 %	15 %	23 %	57 %	14 %	32 %
2018–2020	69 %	12 %	12 %	50 %	4 %	0 %
2019–2021	70 %	9 %	10 %	41 %	7 %	7 %
2020–2022	70 %	12 %	16 %	59 %	19 %	25 %
2021–2023	63 %	13 %	14 %	48 %	11 %	19 %

Single-parent families who are not living in fuel poverty are much less stuck in their situation than the population as a whole.

But what about households that do not remain in their state?

Probabilities of transition between states for 2017-2019 et 2019-2021



Probabilities of transition between states

		NFP	FP	SFP			NFP	FP	SFP	
2017-2019	NFP	0.68 0.67	0.29 0.29	0.03 0.04	2020-2022	NFP	0.69 0.51	0.28 0.43	0.03 0.05	
	FP	0.49 0.40	0.40 0.53	0.10 0.08		FP	0.49 0.44	0.36 0.40	0.14 0.16	
	SFP	0.23 0.32	0.48 0.44	0.29 0.24		SFP	0.25 0.26	0.46 0.48	0.29 0.26	
2018-2020	NFP	0.71 0.63	0.27 0.33	0.03 0.04	2021-2023	NFP	0.69 0.56	0.27 0.34	0.04 0.11	
	FP	0.49 0.37	0.39 0.49	0.12 0.14		FP	0.47 0.36	0.38 0.44	0.15 0.20	
	SFP	0.21 0.28	0.43 0.33	0.36 0.33		SFP	0.20 0.16	0.41 0.39	0.40 0.44	
2019-2021	NFP	0.73 0.72	0.24 0.23	0.03 0.05	Entire population Single-parent family					
	FP	0.53 0.43	0.37 0.45	0.10 0.12						
	SFP	0.27 0.28	0.44 0.38	0.29 0.34						

Conclusion

- ▶ In 2022, fuel poverty increased significantly.
- ▶ The proportion of stayers not in fuel poverty or in severe fuel poverty has decreased compared to the reference period.
 - ⇒ **The situation of households is less stable over time. It has deteriorated for NFPs.**
- ▶ For the periods considered, the transition probabilities for movers are similar, with the exception of **the probability that movers in severe fuel poverty will remain in their current state**. This probability **increased at the start of the COVID-19 pandemic and the energy crisis**.
- ▶ When the data for 2024 becomes available, we will be able to see whether these effects persist.

Conclusion

The analysis was carried out, for the period 2021-2023, according to the main energy source used for heating the dwelling.

- ▶ Households in severe poverty whose main source of heating is gas or fuel oil are more likely to remain in their situation than those whose main source of heating is electricity.

	NFP	FP	SFP
Electricity	0.63	0.11	0.10
Gas	0.63	0.12	0.17
Fuel oil	0.67	0.15	0.20
Estimated proportion of 'stayers'			

- ▶ For movers whose main source of heating is gas or electricity, the probabilities of transition between states are similar. On the other hand, movers whose main source of heating is fuel oil, the probabilities to move from severe fuel poverty to non-fuel poverty are higher than for others.
- ▶ One of the objectives of the rest of the study is to understand these disparities.



THANK YOU FOR YOUR ATTENTION

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